THE BOSTON
Medical and Surgical
JOURNAL

VOLUME 190 MAY 1, 1924 NUMBER 18

ORIGINAL ARTICLES

The Citrate Method of Blood Transfusion After Ten Years. A Retrospect.*

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NEARLY a decade has elapsed since I[1] proposed the citrate method of blood transfusion as a simple way of transferring blood from one individual to another. This method soon became the most popular method of blood transfusion and has been used extensively in different parts of the world. While the vast majority of the medical profession favor this method, a small minority has consistently maintained that the mixture of an anticoagulant with the blood devitalizes the cells composing the human blood and thus diminishes the clinical value of the transfusion. Furthermore, it has been claimed that chills following transfusion of citrated blood occur too frequently to make the method commendable for general use.

In view of these criticisms the lapse of nearly ten years since the introduction of this method may be an opportune time to review its development, and to compare results obtained by citrate transfusions with those obtained by using uncitrated blood.

In order to arrive at some definite conclusion as to applicability and limits of the different methods we must discuss briefly the different ways now at the disposal of the profession for transferring blood from donor to recipient.

Methods of blood transfusion fall within two groups; (1) direct method and (2) indirect methods.

The only true form of direct blood transfusion is the vessel anastomosis either by direct suture (Carrel) or by means of a cannula (Crile, Elsberg), which brings the intima of the donor's vessel in direct opposition to the intima of the recipient's vessel. This method was the method of choice for transfusion of blood until about 12 years ago. With the introduction of the indirect methods the vessel anastomosis soon became obsolete. Reasons for the rapid supplanting of the direct method by the more modern methods are its very difficult technique, the fact that the donor's vessel has to be exposed and cut, thus decreasing his availability for further transfusions, and the inability of determining exactly the amount of the transfused blood, which is a serious danger to donor and recipient. There can be no doubt that, theoretically, vessel anastomosis still presents the ideal method of transfusion, as the constituents of the blood are carried from donor to recipient without interposition of any foreign material. Practice, however, has shown that blood transfused by indirect methods is of the same clinical value and that objections to the use of these modern methods are purely theoretical.

The indirect methods may be best classified according to 5 groups: (1) Cannula method (Bernheim[2]); (2) syringe-cannula method (Lindeman[3]); (3) Paraffinized glass cylinders (Kimpton and Brown[4], Vincent[5], Percy[6]); (4) stop-cock methods (Unger[7], Miller[8], Bernheim[9], etc.,); (5) citrate method.

The mistake is sometimes made in the literature of classifying the first four groups with the vessel anastomosis under the direct methods, in contradistinction to the citrate method. Such grouping is erroneous and not based on facts. As stated above, the direct method requires an unobstructed contact of live tissue between donor and recipient. None of these different groups of apparatus fulfil this requirement, as glass or metal is interposed betwen the vein of the donor and the vein of the recipient. Therefore, all these methods must be grouped with the citrate method among the indirect methods.

(1) *Cannula method (Bernheim).* This method requires a few words of discussion as Horsley[10] has lately tried to revive it. Horsley erroneously calls this method a direct method. An 8 cm. cannula coated with paraffin is interposed between the vessel of the donor and the vessel of the recipient. Thus this method though suffering from the same defects as the direct method (difficult technique, section of the donor's vessel and inability to estimate the quantity of the transfused blood), must be classified among the indirect methods. Instead of collecting the blood in a large coated cylinder, the blood is sent through a coated cannula, thus involving transfer via a foreign body, though without the obvious advantages of the glass cylinders.

*Read (by invitation) before the Suffolk District Branch of the Massachusetts Medical Society, Boston, Feb. 27th, 1924.

(2) *Syringe-cannula method.* This method, developed by Lindeman, will always be mentioned in connection with the development of the technique of blood transfusion. It represents the first step towards the simplification of the technique of transfusion. This method, published eleven years ago, is hardly used at all at present. As compared with the vessel anastomosis the syringe cannula method was a most decided step forward from the point of technique. However, the stop-cock, glass cylinder and citrate methods have supplanted this method. The syringe cannula method requires a well trained staff of at least three persons. Without proper team-work this method is apt to fail. For this reason its popularity was of short duration.

The last three groups of indirect methods, though now in use for over ten years, have all survived this lapse of time. The fact, that they are in use at present is sufficient proof that all these methods have inherent values which make them commendable to the medical profession.

(3) *Paraffinized glass-cylinders.* It would mean carrying coals to Newcastle, if I were to discuss in detail this method before this audience. This method was devised by Kimpton and Brown. In its original form it required a dissection of the vein of both donor and recipient. Vincent overcame this objection by attaching a cannula with a piece of rubber to the glass cylinder. I have repeatedly seen this method used and it works beautifully in the hands of experts. The proper coating of the cylinders requires a good deal of experience and skill.

(4) *Stop-cock methods.* The most popular of the stop-cock methods was devised by Unger. The fact that this method was devised at Mt. Sinai Hospital, where it is still in use at present, has given me ample opportunity to form an opinion based on close observation. Its main objection is the fact that donor and recipient have to be brought close together. It is not a bedside method. Many patients are too sick to be moved. Others (especially women) object to being brought into too close a contact with professional donors. In cases of blood infections this method is strictly contraindicated on account of the danger of infection for the donor.

(5) *Citrate method.* My personal experience with indirect methods is entirely confined to the citrate method. This was devised after a few not very successful attempts with the direct method had convinced me, that the technique of blood transfusion had to be simplified materially before it could take its proper place in our therapeutic armamentarium. The citrate method has undoubtedly the distinction of being by far the simplest of all the modern methods of blood transfusion.

The attempt to find an innocuous anticoagulant is not new. In fact attempts in that direction date back about sixty years. At that time sodium phosphate and sodium bicarbonate were tested with this point in view, though without success. When given in doses sufficient to prevent coagulation they were toxic. For the same reason attempts with hirudin with which I started my experiments on the use of an anticoagulant in blood transfusion had to be abandoned.

The next step consisted in testing the applicability of sodium citrate for use in human blood transfusion.

Sodium citrate was the anticoagulant par excellence in laboratory work. For this purpose it was used in 1% strength. Animal experiments soon showed convincingly that a 1% mixture of sodium citrate with the blood would prove fatal to the recipient. The problem then presented itself to investigate whether a much smaller percentage of sodium citrate would not be sufficient to prevent coagulation and whether such a minute dose of sodium citrate might be introduced into the circulatory system without causing any toxic effects. A series of animal experiments, in collaboration with Dr. George Baehr, showed that the supposition that a 1% mixture of sodium citrate with the blood was necessary to prevent coagulation was erroneous. A little more than one-tenth of that dose, namely 0.15% is sufficient to prevent coagulation. Sodium citrate, given in such small quantities, is absolutely harmless. The maximal dose for an adult is about 5 grams. These facts, proven by animal experiments, established the citrate method of blood transfusion. It might be of interest to point out to some antivivisectionists that this method which has saved innumerable lives not only among the civil population but also among our soldiers in France could never have been developed without the sacrifice of a few animals.

Another most important fact was first observed by Weil[11], i. e., the shortening of the coagulation time of the recipient's blood following the injection of sodium citrate either pure or in the form of citrated blood. This shortening lasts for a couple of hours only.

The technique of the citrate method of blood transfusion, now in use for nearly ten years, does not require any detailed description. As originally devised, it consists of two separate acts, the taking of blood from the donor by venesectio (Fig. 1) and the infusion of the citrated blood into the recipient (Fig. 2). The extreme simplicity of this technique should appeal to the medical profession. However, many unnecessary attempts have been made to construct a more complicated apparatus for the use of citrate transfusions. At least fifty different instruments have been suggested, none of them as simple as the original and none more efficient than the simple apparatus shown in the accompanying pictures. In order to make a method truly popular the apparatus ought to be cheap

and easily replaceable. The outfit as pictured on Fig. 3 consists of parts which are in stock in any hospital (cannulae, glass-containers, salvarsan apparatus, etc.).

One step only in the whole procedure requires a certain amount of skill, namely, the proper insertion of a good-sized cannula into the vein of the donor. The proper execution of a citrate transfusion depends on the rapid flow of the donor's blood into the glass jar containing the citrate solution. If blood and citrate solution mix rapidly, no clots—not even minute ones—will form. Straining of the blood through gauze before the injection of the citrated blood into the recipient is entirely unnecessary.

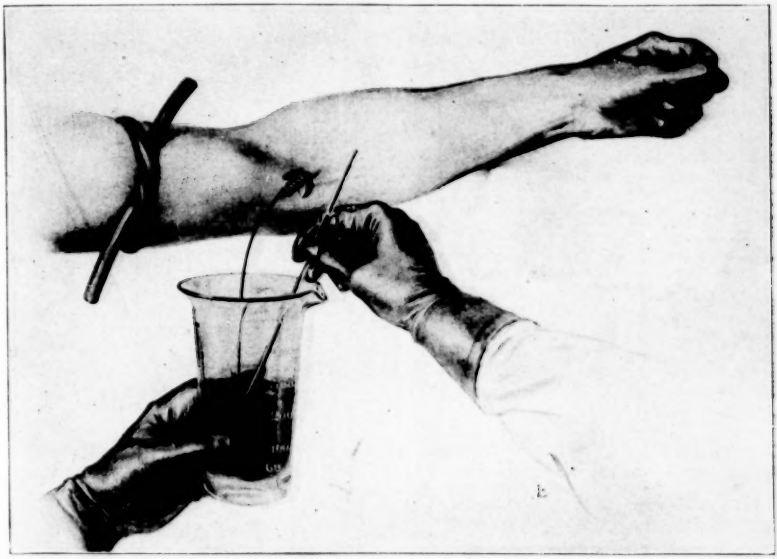

FIG. 1: Taking Blood from the Donor.

The extreme simplicity of the citrate method had one inherent danger. It was thought that anybody who had ever performed a phlebotomy or given an intravenous saline infusion could successfully transfuse citrated blood. Therefore, in many hospitals, citrate transfusions were turned over to very inexperienced men, often the youngest member of the house-staff, whereas the other infinitely more complicated indirect methods were always performed by experts. The result was that in a number of clinics many more chills followed the citrate method, than the other indirect methods. Instead of blaming the faulty technique of the poorly trained operator for these chills, the method as such was blamed. A strong opposition was thus created against the citrate method.

I would like to illustrate this point by quoting figures obtained in Mt. Sinai Hospital where, as stated above, both the Unger and the citrate methods are in use at present. In my last paper on this subject I quoted the following figures for transfusions given between January 1st and November 1st, 1922: 34 citrate transfusions were followed by 8 chills (23%), and 29 Unger transfusions were followed by 10 chills (34%).

These figures were so high, the percentage of chills had risen so rapidly as compared to our previous statistics, that they required an investigation. It was found that many transfusions were performed by some of the youngest members of the house-staff. It was then decided to permit only the house physician or surgeon or the senior physician or surgeon to perform transfusions. In our organization a member of the house staff becomes senior physician or surgeon after sixteen months of service, and house physician, or surgeon, after twenty months of service. He leaves the hospital after two years' training.

The following results were obtained after this reorganization:

104 patients received 143 transfusions in 1923.

60 Unger transfusions were followed by 5 chills (8%), and 83 citrate transfusions were followed by 11 chills (13%). Thus, by simply

taking transfusions out of the hands of the inexperienced men, chills following the Unger method were reduced from 34% to 8%, those following the citrate method from 23% to 13%. The Unger method, which is much more difficult to perform than the citrate method, had naturally suffered more through the laxity of our system.

All the 143 tranfusions quoted above were given by members of the house-staff. With the exception of a few emergency cases, a member of the attending staff was present during the transfusion.

These figures are significant. They give an opportunity of comparing post-transfusion reactions following citrated and uncitrated blood. Citrate transfusions had only 5% more chills than Unger transfusions. I think it would be advisable for those who have reported much larger figures (from some sources, over 40% chills following citrate transfusion have been reported) to revise their technique instead of blaming the method for the unsatisfactory results. If an organization of young men, such as constitute our house-staff, can keep the number of chills in the neighborhod of 10%, any figures considerably higher cannot be attributed to innate defects of the method.

The value of a method cannot be measured by results obtained by experts. These may represent the possible highest achievements, but they do not represent average results. The fact that Lindeman[12] was able to report 214 consecutive transfusions with the syringe cannula method without a chill is no indication that others, who are not specializing in this work, can duplicate his results.

Horsley[13] has lately reported 54 consecutive transfusions with the Bernheim cannula without a chill. Even if he will be able to duplicate

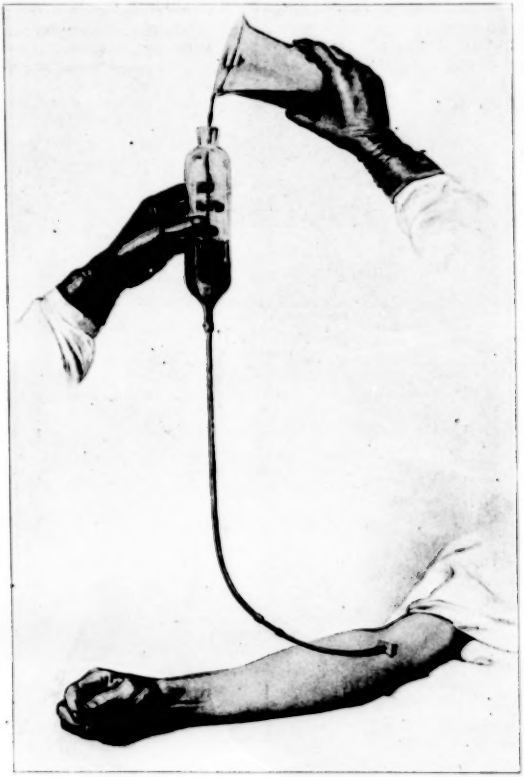

FIG. 2: Infusion of Citrated Blood into the Recipient.

Lindeman's series of 214 consecutive cases without a chill, such report would not be a proof of the superiority of the method, but only a proof of Horsley's exceptional skill in its execution.

If the 143 transfusions quoted above had been given by experts, the percentage of chills would surely be lower. Thus at the Mayo clinic, where transfusions are administered in a special department, 677 citrate transfusions, given in 1923, were followed by less than 10% chills.

The slight preponderance of chills following the citrate method, as evident in our series, is probably caused by the chilling of the blood during the transfer from donor to recipient. The difference in the number of chills (5%) is certainly outweighed by the simplicity of the

Further evidence that sodium citrate, when mixed with blood, does not cause any chills is obtained from Neuhof and Hirshfeld's[14] experiences. They have, in a large series of cases, injected 6-8 gms. of sodium citrate intravenously (a dose more than 5 times as large as that used in the average citrate transfusion) without ever observing a chill.

In performing a citrate transfusion great care should be taken to see that the cannulae are thoroughly cleaned, before they are used. The glassware should be sterilized in an autoclave and kept in readiness. It is not advisable to sterilize the glassware and tubing immediately before the transfusion is given, as heat causes coagulative changes in the blood with subse-

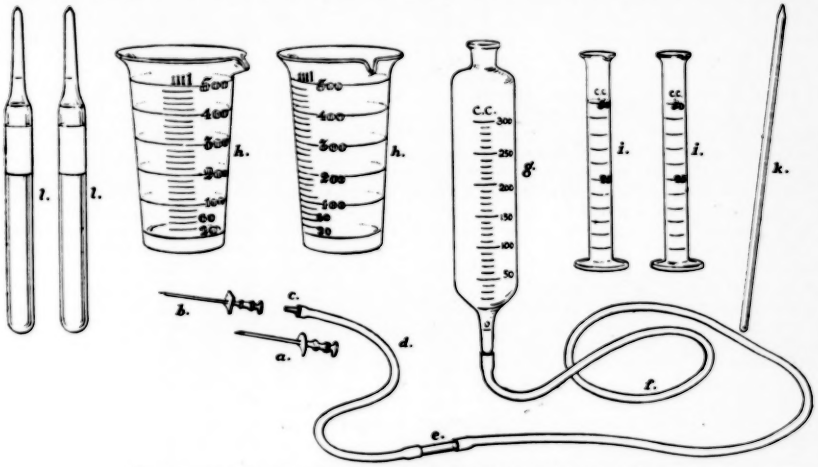

FIG. 3: Complete Outfit for Transfusion of Blood with the Aid of Sodium Citrate

a and b, Cannulae; g, salvarsan flask with rubber; (d f) glass taper connect (e) and adapter (c); i, small glass jars; h, two large glass jars; k, glass rod; l, two glass ampoules containing 50 cem. of a sterilized 2.5% solution of sodium citrate.

citrate method, as compared to other indirect methods. It is evident that sodium citrate itself is not responsible for the additional 5%, as otherwise the difference between post-transfusion chills for citrated blood as compared with those for uncitrated blood would be much larger.

It would probably be easy to prevent the chilling of the blood by the use of a thermos bottle. However, such a bottle would require special construction in order to enable us to determine exactly the amount of blood taken from the donor. Bottles of this special type would be very expensive and not easily replaceable after breakage. The difference in the number of chills (citrated versus uncitrated blood) is too slight, to warrant complicating the very simple technique of the citrate method, as it is used at present.

quent chills. The citrate solution should be freshly prepared, unless it is kept in sealed tubes.

In a rather extensive experience with transfusions, during the past nine years, I have had ample opportunity to compare chills following citrate transfusions with those following transfusions given by the Unger apparatus. The chills do not differ in the effect on the general condition of the patient. I am sure that the chills following a Kimpton-Brown transfusion are of the same character as those following an Unger transfusion,—in other words post-transfusion chills are of the same nature, no matter what method is used.

I have never seen a serious accident following a citrate transfusion. The literature contains several reports of death following citrate transfusions. These are undoubtedly

due to faulty technique, wrong indications, or errors in the tests for hemolysis and agglutination; they cannot be attributed to the small quantity of sodium citrate used in the blood transfusion.

The other objection brought forward against the use of citrate transfusion is the claim that sodium citrate devitalizes the blood cells and thus depreciates the clinical value of transfusion.

Unger[15] has published results of experiments and claimed that sodium citrate has a deleterious effect on the blood. He states that, according to his investigations, citrated plasma has anticomplementary power, and sodium citrate increases the fragility of the red blood cells, and decreases the phagocytic power of the leukocytes. Were Unger's experiments conclusive, the applicability of the citrate method would be limited to cases of hemorrhage. It could not be used either in diseases of the blood (pernicious anemia, purpura hemorrhagica, etc.,) or in cases of subacute or chronic sepsis. In other words, its use would be strictly contraindicated in a great number of diseases, in spite of the fact that this method has been used in the treatment of these conditions, with excellent clinical results, for many years.

It was clear without further experiments that Unger's conclusions concerning the inhibitory action of sodium citrate on the leukocytes was erroneous; for in the Wright opsonic index determination, in which the phagocytic activity of the leukocytes is to be measured, leukocytes are collected in from 1.5 to 2 per cent sodium citrate solution. This is ten times as strong as the percentage of sodium citrate used in transfusion.

The other two points claimed by Unger have been disproved by the recent work of Mellon, Hastings and Casey[16]. They state that the results of their experiments are, in the main, "diametrically opposed to those of Unger." They found on anticomplementary power in citrated plasma, and no deleterious effect either on the red or on the white blood cells.

Ashby[17] has proven in a very ingenious set of experiments on animals and human beings that the donor's red blood cells, though mixed with sodium citrate, preserve their vitality in the blood of the recipient for at least thirty days, another proof against Unger's arguments.

Evidently Unger's conclusions are entirely wrong and it is most regrettable that these faulty observations have been quoted extensively in the literature. The wrong impression was thus created that citrated blood could not be used advantageously in a large variety of diseases.

Some authors call the stop-cock and glass cylinder methods, i. e., those methods in which no sodium citrate is used, "pure blood" methods in contradistinction to the citrate method. Such a classification is a misnomer. Citrated blood does not represent an impurity. I am sure that air bubbles which are always injected with any syringe method or small particles of paraffin which might be introduced into the recipient's circulation when using paraffinized glass cylinders are as much of an "impurity" as the small amounts of sodium citrate used in citrate transfusions.

The best proof of the harmlessness of a sodium citrate transfusion has always been, in my opinion, its beneficial use in melaena neonatorum, that alarming disease of the new-born infant. I have injected betwen 80 and 100 ccm. of citrated blood into more than a dozen infants (six of them 2 days old) without any untoward symptom. If we can safely give 100 ccm. of citrated blood to a new-born baby, weighing seven pounds, surely no untoward symptoms need be feared when giving 500 or even 1000 ccm. to an adult.

A citrate transfusion in the new-born infant illustrates exceedingly well the great advantages of this method from a technical point of view. We do not have to resort to the longitudinal sinus, a rather dangerous way of approach. Neither is an exposure of the external jugular vein required, a procedure which leaves a disfiguring scar. I have never had any trouble in introducing a fine cannula into the median cephalic vein nor have I seen clotting occur in the cannula. The other methods are all based on rapid injection of the blood, before coagulation occurs. For that reason they cannot use the only simple and safe way of approach—the median cephalic vein. With the citrate method the blood can be allowed to run very slowly through a fine cannula, as clotting of the blood is not to be feared. In fact the slow infusion is a safeguard against a too sudden overloading of the baby's circulation. It is a well known fact that following one transfusion these infants grow up without showing any tendency toward abnormal bleeding.

We have so far discussed the different methods of blood transfusion and compared the post-transfusion chills following the citrate method with those following the other indirect methods. A few words seem to be in order as to the clinical value of the citrate method as compared with the other methods of blood transfusion. Citrate transfusion is of exactly the same clinical value as any other method of blood transfusion. The fact that at Mt. Sinai Hospital both uncitrated and citrated bloods have been used during the last nine years has afforded a rare opportunity to compare the effects of both methods in many individual cases. In a large number of patients, the stop-cock method was used, after the citrate method had failed to effect a cure. In none of these was the clinical result after the injection of uncitrated blood superior to that following the citrate transfusion. The

absence of a good clinical effect had to be attributed to the underlying disease, not to the transfusion method.

As the time is too short to quote many instances, I simply refer to one illustrative case. A patient was admitted to the Hospital suffering from pernicious anemia. Following an Unger transfusion the haemoglobin rose from 19% to 28%, with a subsequent spontaneous rise to 53%. She left the hospital in good condition. She was readmitted four months later with 24% haemoglobin. Following a citrate transfusion the haemoglobin went up to 33%. In view of the excellent clinical result after the previous Unger transfusion (rise from 19% to 53% haemoglobin) the physician felt that the citrate transfusion was to blame for the failure to respond to the second transfusion. Two Unger transfusions were then given. The haemoglobin rose, however, only a few points and the patient died soon after. Evidently the pernicious anemia had advanced so far that transfusions could not stop the progress of the disease. The Unger method was as futile as the citrate method in this case.

One of the most interesting phases of the chemical action of sodium citrate on the blood is the shortening of the coagulation time. Theoretically, we would assume that following the injection of an anticoagulant into the blood stream, the coagulation time would increase. The contrary is the case, inasmuch as the coagulation time is markedly shortened. This shortening is transitory and the coagulation time returns to normal in a few hours. This most interesting phenomenon was first observed by Weil. Neuhof and Hirshfeld have attempted to apply this action of sodium citrate on a large scale as a hemostatic by injecting 6 to 8 gms. intravenously. However, the results do not seem to be very encouraging. I pointed out in my original paper that doses above 5 gms., when given intravenously, may have serious toxic effects. Experience has shown that a dose of 6-8 gm., as suggested by Neuhof & Hirshfeld, must be injected very slowly (the injection should take 10-15 minutes) in order to avoid toxic effects. One sudden death has been observed, where their instruction was not followed and the injection given too rapidly. This unfortunate result confirms my statement, made ten years ago, that intravenous injections of large doses of sodium citrate are not without danger to the patient. For this reason the intravenous injection of large doses of sodium citrate in an attempt to stop hemorrhages has not acquired popularity. When given intramuscularly, the injection is very painful and necrosis may follow. When injected subcutaneously the injection is perfectly safe. However, the coagulation time does not seem to be shortened and the haemostatic effect is negligible.

Rosenthal and Baehr[18] found that the paradoxical shortening of the coagulation time is based on the action of sodium citrate on the blood platelets. These show an immediate diminution, but their number more or less quickly (within ½ to 1 hour) returns to normal. Counts show that over 85% of the platelets have been suddenly removed from the systemic circulation. They state that the destruction and removal of the blood platelets is not a direct action of sodium citrate. After having been in contact with sodium citrate the platelets are suddenly and rapidly removed from the circulation, probably by the spleen, and then destroyed. The destruction of the blood platelets is followed by a discharge into the blood of their contents, the thromboplastic substance cytozyme, with the resultant shortening of the coagulation time of the blood. Simultaneously fresh blood platelets are mobilized.

It would be interesting to investigate this question further by studying the action of sodium citrate on the blood platelets after a preliminary splenectomy.

Rosenthal and Baehr advocate intravenous injection of sodium citrate (in the form of citrated blood, rather than in 30% solution as advocated by Neuhof and Hirshfeld) in cases of hemorrhage due to gastric ulcer, typhoid fever, pulmonary tuberculosis, etc. They state that although the coagulation time is often materially shortened, no tendency to intra-vascular thrombosis has ever been observed.

Furthermore they state that in hemorrhagic diseases (purpura, hemophilia) the use of sodium citrate intravenously is strictly contraindicated.

These experiments of Rosenthal and Baehr prove that the intravenous injection of large doses of sodium citrate affect the blood platelets. They used 0.5 grams of sodium citrate in their experiments on cats. This dose would equal 10 grams in an adult. The usual dose of sodium citrate, used in a transfusion of average size, is about 1 gram, one tenth of the dose used in Rosenthal and Baehr's experiments. It is very probable that if they had experimented with smaller doses, their conclusions would have been different.

There is no clinical evidence that a small dose of sodium citrate, as used in citrate transfusion, diminishes the clinical value of blood transfusion either in purpura or hemophilia.

P.—Emile Weil[19] pointed out in a recent paper before the French Surgical Congress; "the organism has always reserves of calcium which can neutralize rapidly this small quantity of sodium citrate." He has used citrated blood both in hemophilia and purpura and considers citrated blood as "du sang complet et vital."

I have given many transfusions in the attempt to stop hemorrhages in hemophiliacs and the results have always been good.

May I cite a very instructive case? A young

boy was suffering from a severe purpura hemorrhagica following chickenpox. He was in a most deplorable condition. He had large hemorrhagic extravasations of the skin all over his body and he passed large quantities of blood per rectum. An immediate citrate transfusion failed to stop the hemorrhages and his condition grew rapidly worse. Another citrate transfusion was given the following day using a different donor. This time the effect was most spectacular. The patient's condition changed immediately, the hemorrhages stopped and he made an uneventful recovery. If we had substituted uncitrated blood for citrated blood on the second transfusion, we would have certainly blamed the citrate method for the failure of the first transfusion. Evidently the brilliant effect of the second transfusion was due to the superiority of the blood of the second donor.

In a considerable number of cases of hemorrhages in hemophiliacs following incised wounds, bites of tongue, etc., the citrate transfusion stopped the hemorrhage immediately.

True purpura has an actual deficiency in blood platelet count, whereas in hemophilia the count may be perfectly normal but the platelets may be deficient in thrombophilic substances. If further experiments with smaller doses of sodium citrate should confirm Rosenthal and Baehr's observations on the destruction of blood platelets, these diseases should be preferably treated with uncitrated blood, if the proper organization, necessary for any of the other more complicated transfusion methods, is at hand. For the present we have no definite reason to correct the statement that the citrate method can safely be used both in hemophilia and purpura.

A consideration of the comparative values of the different methods of blood transfusion would not be complete without a short discussion of the contraindications against the use of those methods, in which donor and recipient are in direct connection during the transfusion. In cases of infectious diseases of the recipient (typhoid fever, tuberculosis, syphilis, sepsis, measles, etc.) these methods are strictly contraindicated, as they represent a serious danger to the donor. In cases of this nature neither the Bernheim-Horsley method nor the Lindeman or the Unger apparatus should be used. The Lindeman syinge-cannula method though donor and recipient are not directly connected could be used only, if a sufficient number (20-30 syringes) were available, so that the same syringe never returns to the donor, after it has been used on the recipient. On the other hand, the Kimpton-Brown tube can be used with perfect safety, if the individual glass cylinders are not used again for the donor after they have reached the recipient.

In babies and small infants the citrate method ought to be the method of choice. (See above.)

When members of the family are used as donors, the citrate method is preferable. The citrate method—in contradistinction to all other methods—does not require donor and recipient to be in the same room. Thus a great shock for the donor and recipient is avoided.

When the patient is a young girl, the close proximity between the recipient and a professional donor may be most unpleasant for the patient.

Following a profuse hemorrhage (from the lungs, the stomach, intestines, etc.) the patient should not be moved, not even to an operating room. The only simple bedside method is the citrate method. Citrated blood, as seen above, offers the additional advantage of temporarily shortening the coagulation time of the blood. Thus citrated blood ought to be used in all cases of profuse hemorrhages.

Transfusions in typhoid, measles, or other infectious diseases, should certainly not be performed in an operating room, when they can be done with ease in the wards with citrated blood. All infectious cases certainly present a danger to the asepsis of the operating room, a very important factor in the routine of any surgical service.

I have confined myself in this paper to a discussion of the technique of blood transfusion. However, before closing, I would like to touch upon two other chapters which are just as important as the technique, i. e., blood tests and indications.

It is impossible to overemphasize the importance of the tests for hemolysis and agglutination. In fact, the foundation for the modern era of blood transfusion was built principally upon the epochal work of Landsteiner[20] and Shattock[21]. Without their fundamental observations, that human blood must be divided into four groups, blood transfusion could never have stood on a firm basis. The development of the technique, important as it was for the popularization of blood transfusion, plays only a secondary role as compared to the tests.

The technique of these tests was formerly most complicated. A couple of hours were required for their proper execution. However, they have been simplified—just as transfusion itself—to such an extent that they can now be performed in a few minutes.

Available donors are now usually classified following blood tests into four groups, and a list of their names kept on file for future use. When a patient requires a transfusion he is grouped and either a donor of his own group or a so-called universal donor (Group I) is sent for. Undoubtedly a more accurate, though somewhat more complicated procedure, is the direct matching of donor and recipient. Post-transfusion chills occur less frequently when donor and recipient are thus tested against each other.

Guthrie and Huck[22] have lately described sub-

groups, in addition to the four well known groups. It is too early to state, whether these additional groups will play a role in reducing post-transfusion chills.

A recipient may change his group after a transfusion. It is, therefore, of the utmost importance that the recipient be tested again before a second transfusion is given. Serious consequences may follow, unless proper attention is paid to this very important fact, first observed about ten years ago by Libman and Ottenberg[23].

The indications for blood transfusion should be made after careful consideration, otherwise a great deal of harm may be done to the patient. However, transfusion of blood, used with proper care as to technic and indications, undoubtedly represents one of the most useful procedures in medical practice.

Instead of discussing in detail the indications for blood transfusion I shall merely emphasize a few points of importance.

The greatest danger of blood transfusion has always been its indiscriminate use. Blood transfusion is often suggested in cases, where it cannot do any good and may possibly do a great deal of harm. For instance, to give a patient, who is in extremis suffering from inoperable cancer, a transfusion is not without risks and is certainly useless. If such a patient dies during or immediately after the transfusion, the transfusion is naturally blamed for the sudden fatal outcome.

We have learned that in acute leukaemia and in acute sepsis blood transfusion is useless. Furthermore, a severe reaction may follow, no matter what method is used, and may seriously endanger the patient's life. If the possible dangers of transfusion in such cases were properly explained to the relatives, they would justly hesitate to give their consent. Transfusion of blood should not be advised, "ut aliquid fiat," otherwise the whole procedure will be discredited.

On the other hand blood transfusion in properly selected cases is one of the most wonderful therapeutic agents at our disposal. Anyone who performs a good many transfusions can easily remember many cases which were apparently snatched from almost certain death by this procedure.

The organization should be ready at all times, since many transfusions (especially those to combat hemorrhage) must be performed almost at a moment's notice.

TABLE

RESULTS OF TRANSFUSION OF CITRATED BLOOD

1915-1921

Disease	No. of Cases	No. of Trans.	Cured	Improved	Not Improved	Unknown	Died
1. Hemorrhage							
a. hemophilia and allied conditions	19	24	11	5			3
b. purpura	21	27	4	7		2	8
c. gastro-intestinal hemorrhage	15	25	3	2			10
d. cholemia	8	16	1				7
e. post-operative hemorrhage	16	20	7				9
f. hemorrhage from female genital organs	4	5	2				2
g. traumatic hemorrhage	3	5	2				1
2. Diseases of the blood							
a. Pernicious anemia and leukemia	40	65		20	4		16
b. Primary and Secondary anemia	9	13	5	2	1		1
3. Preoperative and postoperative transfusions	92	118	37	4	2	2	47
4. Sepsis	10	12			1		9
5. Incurable conditions (transfusions performed at request of family)	20	20					20
6. General debility	11	14	1	4		1	5
7. Acute poisoning	1	1	1				
TOTALS	269	365	74	44	8	5	138

TABLE

The accompanying table shows our results between 1915 and 1921. The vast majority of transfusions were done to replace lost blood volume or as pre-operative and post-operative measures.

I have had no personal experience with blood transfusion in infectious diseases, in which a convalescent donor was used. This newly developed field for further usefulness of blood tranfusion is still under discussion.

The active immunization of a donor for blood transfusion in acute sepsis has not passed the experimental stage. Gradual immunization is, of course, harmless for the donor. However, such a process takes a few weeks, whereas immunized blood must be obtained in 24 or 48 hours to be useful in cases of sepsis. Rapid im-

munization, as advocated by Unger[24], has such grave inherent risks for the donor that both donors and physicians will justly hesitate to use this method.

In conclusion, I would like to state once more that objections brought forward against the clinical value of citrated blood are without proper basis. There can be no doubt that citrate transfusion is therapeutically just as efficient as transfusion by any other method. Furthermore, no matter what method is used, the transfusion chills are of the same nature.

The great popularity of blood transfusion in our present age depends entirely on the development of this simple method. All the other methods, though very efficient in the hands of a few experts, are much too complicated to make them available for general use. If the citrate method would be abolished today, the benefit of blood transfusion for the public at large would be seriously curtailed.

Jeanbrau[25] in presenting the subject of blood transfusion before the French Surgical Congress in 1923 comes to the following conclusions: "in civil and in military practice, in surgery and in medicine, transfusion of citrated blood is the method of choice on account of its simplicity, its safety and its efficacy."

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Treatment of Late Syphilis

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It is a pretty generally accepted fact that the groundwork of much of the late syphilitic picture is laid during the early weeks of the disease, and that the treatment of the late syphilitic begins with his first visit to us. Every diagnostic refinement, whether of the physician or the laboratory, which aids in the earlier detection of the presence of the disease, or of its destructive activity in any vital organ at any time during its course, is also an essential part of its late treatment. The clinical study of syphilis, especially of its natural history, is perhaps more important today than ever before, and should include a workable knowledge of its possible late effects on every organ of the body.

Obviously the therapeutic indications and the means by which they may be most safely and effectively met, change with the progress of the disease. In its early stages they are simple and direct. To strive for prompt and radical cure, and to protect others from infection. Fortunately treatment of the one goes far toward control of the other. But we are still obliged to admit that our early efforts are not, as yet, always successful, and until that desirable goal is reached, we should try to so direct them that insofar as they fall short of complete cure, they will at least lessen the frequency and severity of the late complications by increasing the natural resistance to the disease, so that his periods of latency will be more frequent and prolonged.

These periods of latency may be regarded as normal phases of the uncured disease, and while they are to be considered as periods of potential activity and closely watched, they seem to me to

*Read before the Worcester District Medical Society.

be wholly desirable. They represent a truce between the patient and his disease in which its activity is suspended or at a minimum, and if this balance could be maintained it would be second only to cure. I cannot escape the conviction that its presence should be respected during the middle and late periods of the disease, and treatment instituted only after careful consideration of its possible effect on this equilibrium. And I feel also that in many cases it must be regarded as the goal of our late therapeutic efforts.

If our early efforts fail, the hope of complete cure lessens with each succeeding year, and our treatment becomes more and more directed toward the relief of symptoms, the maintenance of efficiency and the prolongation of life. Our therapeutic objective has become arrest rather than cure. Also his danger to his contacts decreases with the age of the disease, and gradually narrows itself to the family and more particularly the offspring, so that our therapeutic interest in that phase of the late disease has to do chiefly with the potential father and the expectant mother. Early in its course his disease menaces his associates, later his family and finally himself. The last is perhaps the most difficult therapeutic problem.

The majority of cases of early syphilis occurs in comparatively healthy young adults, and as a general infection. This calls for fairly uniform and routine treatment of the disease as a whole, and it can be given with promptness and vigor and at a minimum risk, always provided that its effects are carefully watched with a view to readjustment at need to individual requirements. It is generally conceded, I think, that asphenamine is our chief weapon of offence at this time, and may properly be used to open the attack, and in the absence of untoward effects, be pushed to its maximum early in the course. At that time its spirillicidal effect is most necessary and effective, and its dangers least. Mercurial support seems to be most advantageous if so directed as to accompany and follow the asphenamine to complete the course, reaching its maximum toward its end.

But the injudicious use of asphenamine at this time may serve only to endanger the patient's future by preventing or altering the development of his natural resistance, which should normally be his greatest protection in later years. It seems to me that we cannot ignore the apparently relative larger number of late central nervous system and arterial complications, or disregard their possible relationship to the early inadequate or unsupported use of arsenicals. On the other hand, overenthusiasm in their use may overreach his tolerance and necessitate prolonged cessation of treatment, during which time the foundation of much later trouble may be laid.

Such early indiscretions do not serve to brighten the patient's future, or simplify the task of the man who has to deal with the problem later. It were better for him if his early physician had never lost faith in the older and safer mercurial method.

And such must still be the treatment of choice, if not of necessity, in the smaller group of cases in which the disease develops in subnormal, aged or diseased persons. Theoretically they belong with the later types, but practically they are really poorer therapeutic risks, because their physical infirmities are of non specific origin and so more likely to react unfavorably to specific medication without the corresponding improvement and increase in tolerance which may reasonably be expected in the late case, whose limitations are more largely the result of the disease.

Except for cases like these, the late patient presents a far less simple problem than the early one. As the disease grows older we need to exercise greater caution and discrimination, and give more attention to the individual. However valuable intensive treatment may have been early in the disease, we cannot afford to expose him to the risks inseparable from its indiscriminate or routine use at this time. Nor does analysis of the situation reveal, in the majority of cases, any needs which would justify us in so doing, because our therapeutic objectives have changed. We are no longer dealing with a general infection, but with localized and often incapacitating or destructive activities, so that our chief concern is with its possible effect on structures whose functional integrity is necessary to life and the problems of living. We cannot reasonably continue to entertain the same hope of radical cure, but had better concern ourself with determining the location and extent of his activity, in repairing as much as we can of the damage done, and trying to build up his resistance in an effort to promote his comfort and usefulness for the balance of his life. To this end it is well to precede active treatment with an appraisal of his condition, an estimate of his therapeutic needs and the amount of restoration which may be hoped for, a forecast of his tolerance and probable reaction to medication, and the kind and amount of necessary readjustment of his activities to conform with his restricted capacity.

Naturally this calls for a complete and searching examination, needing more often than not, the aid of our colleagues in other special fields of medicine. Determining the presence of syphilis is only the starting point of our investigation, which must take into account not only the inevitable pathologic effects of a prolonged and serious infection, but of such other non specific diseases as may have intervened, and also the physiologic changes incident to advancing years. In this way we endeavor to gauge

as accurately as possible what the insurance people would call his expectation of life, and estimate as best we may, what measures will do most to help him realize and if possible exceed it.

The majority of late cases unquestionably need both the spirillicidal and the resistance building drugs, the latter in relatively greater proportion. Except in certain cases where activity is rapid or menacing, and the vital organs but little damaged; the prompt use of the former is less urgent than was the case earlier, and its attendant risks enough greater to counsel dependence on the older and safer method until we have completed our appraisal and outline of procedure.

The drugs used in the treatment of syphilis are potent ones, and may prove to be organotropic as well as parasitotropic, so that we need to try to calculate their possible harmful as well as their probable beneficial effects. I think we all feel now that chronic disease of viscera seldom contraindicates the careful use of asphenamine, but that certain conditions call for more than ordinary caution. Usually in such cases neo asphenamine is the drug of choice, and in most of them the risk may be further lessened by the preliminary use of mercury or mixed treatment.

Except in the case of low renal function or of infection, the damaged kidney seems to tolerate asphenamine better than mercury. A renal function test should precede and frequent urinary examinations accompany the use of either in late syphilis. The continued presence of casts indicates irritation, and the appearance of blood denotes damage. Naturally one would adopt the intramuscular use of mercury with extreme caution in such cases.

The lower urinary tract is now receiving more attention than formerly, because there seems reason to believe infections there, and conditions favoring retention, diminish his tolerance, retard his progress and favor reactions. Stokes[1] has recently called our attention to the retarding influence of the atonic, neurogenous bladder.

The possibility of cardio-vascular involvement being present in any late case places it high in our list of liabilities. Unfortunately he may show few or no symptoms to confirm our suspicion until the disease is far advanced. Even the slightest clinical signs warrants a preliminary X-ray, and the disclosure of impairment, especially myocardial, demands more than ordinary caution. In the presence of extensive damage a Herxheimer or structural alteration due to too rapid healing might easily prove serious. I feel that any specific treatment should be complementary to that of the internist. Only the milder forms of asphenamine commend themselves, and in carefully controlled dosage. All agree in the need of prolonged mercurial preparation. This is particularly true in the presence of myocardial damage, aneurism or vascular brain syphilis. But in most cases mouth treatment alone is seldom enough, and any treatment may easily prove futile unless supplemented by frequent observation and regulation of his work and habits. Prognosis should be guarded, because symptomatic improvement is often unlikely to be followed by corresponding functional betterment, and by still less structural regeneration.

Asphenamine is hepatoxic as well as vasculotoxic, and like the circulatory system, the liver is frequently and often obscurely involved in late syphilis; and hence must always be included in our survey, because structural damage means lowered tolerance and increased caution. It has been our experience that such cases tolerate mild mercurial or mixed treatment well, and in most cases improve under its use. The liver has great restorative capacity, but it takes time. I have never seen the therapeutic paradox as pointed out by Wile.[2]

There seems to be a more or less well grounded fear that the use of asphenamine in acute or advancing respiratory infections tends to increase the danger of pneumonia, and to aggravate chronic infections.

The so-called Herxheimer reaction, usually regarded as a relatively harmless exaggeration of symptoms occasionally seen at the beginning of arsenical treatment of early cases, may occur as a more or less severe local manifestation in late syphilis. Its seriousness depends on the location and functional importance of the involved structure, the activity of the process and the size of the dose. Its occurrence must be regarded as a possibility in any old or untreated case, and its probable effect considered. The preliminary use of mercury or mixed treatment, because of its slower action, may serve to lessen its severity or prevent its occurrence when vital organs are involved.

Another complication which occasionally punctuates the use of asphenamine is the serious and sometimes fatal arsenical dermatitis. So far its real cause has escaped detection, so that it is hard to foresee or avert. We have been told to watch for such premonitory signs as pruritus, or rash in the flexures and about the wrists. Their appearance is significant, but their absence is no proof of safety, because it may develop without warning after any injection. Stokes[3] believes that focal infections play an important part by sensitizing the skin, and also gives a timely warning that we do not always pay sufficient attention to an irritable skin, or to the history of previous attacks of dermatitis when arranging our arsenical program. Schamberg suggests that the simultaneous use of mercury and asphenamine may have something to do with it. Certainly it would seem unwise to use inunctions during an asphenamine

course. In several cases I have obtained a story of extravenous infiltration.

An eventuality worth keeping in mind in late cases is the possible readjustments in essential structures which may follow our treatment. The affected organ has gradually adjusted itself to the inroads of the disease by compensatory changes, and the too rapid absorption of this adventitious tissue may cause serious structural and functional disturbance. We have all seen cases of cardiac dilatation or aneurism whose development might have been lessened at least, by more leisurely treatment. But slow and progressive dilatation or contraction of scar tissue, where extensive damage has occurred, may be the inevitable outcome in any case, and it is safe to acquaint the patient with the possible impairment of function.

I have no sympathy with the frequently heard statement that the iodides are no longer necessary in the treatment of syphilis. Admittedly not spirillicidal, they are none the less valuable allies of the drugs that are, and their omission would certainly make our results less satisfactory. Their indications are so well known as to be almost classic: relief of the peculiar periosteal pains, often almost unbearably severe: as an aid in early malignant syphilis and in cerebral and arterial involvement at any time: and for the absorption of late infiltrations which serve to protect the organisms from the blood bourne spirillicides. But even the iodides need to be used with some thought if one would secure their maximum benefit for the duration of the disease. We need to keep in mind their well known tendency to excite congestion in the respiratory organs, and their aggravating effect on the haemorrhagic type. We are warned about their use in acute, non syphilic nephritis with dark, scanty and albuminous urine. Too large doses at first, or pushed beyond the point of tolerance, may produce that curious repugnance, which becomes at times almost prohibitive of their future use.

If the iodides aid by clearing the way for the asphenamine, mercury does a still greater service by rendering him less susceptible to their untoward effects, and by increasing his defence against his infection. Asphenamine is a direct spirillicide, mercury an immunity stimulator, and hence its logical complement. Asphenamine strikes the telling blows, but mercury fills in the gaps. It may not directly kill the organisms, but it creates conditions unfavorable to their growth. I do not think we need concern ourselves with the question of its value in syphilis, but rather with how it can best be utilized to secure the greatest benefit with the least danger to the patient. Our problem is to fit the type of preparation and method af administration to the individual. We need to bear in mind its renotropism, the depressing effect of its prolonged use, and its unfavorable action in anaemia not due to syphilis. I have always hesitated to use the insoluble kinds intramuscularly during an asphenamine course or in most patients past middle life. In vascular syphilis of the brain and in many cases of late hepatitis it is the drug of choice, and it seldom fails to prove beneficial when used after asphenamine to complete the course.

I find it hard to agree when I read that the therapeutic test is of no further use. We may need to resort to it less often than formerly, but one does still see cases in which it is of the greatest help after both Wassermann and X-ray have failed. Asphenamine only serves to increase its value, if its limitations be kept in mind. The iodides alone are less reliable than when used with mercury, which is the most specific. Naturally it is most dependable when the lesions are visible or palpable, where its effect can be most accurately gauged. Subjective improvement is less trustworthy, and the usual betterment in his sense of well being should be discounted. Temporary benefit following the use of asphenamine in certain non specific conditions, particularly tuberculous, may deceive us, and the same is true of attempts to provoke a mild Herxheimer for diagnostic purposes. Admitting its shortcomings, it would be rare I think, on the whole, for its trial to jeopardize the recovery of a suspicious lesion, and I feel sure that many of my hearers can recall cases where its use has saved patients from operative procedures which would have proved unsatisfactory.

We need also to have a fairly complete knowledge of his non specific shortcomings, and urge their correction so far as possible, if we would expect the best results from our treatment. Familiarity tends at times to make us careless, and somehow the many details of asphenamine administration seem to get overlooked unless occasionally reviewed. Also we soon learn that certain patients tolerate one preparation of asphenamine better than another, and that the same patient will benefit by an occasional change. Every precaution in technic which aids in preventing reactions, or lessens the toxic or debilitating effects of treatment, is worth careful consideration, because repeated therapeutic insults, even though seemingly insignificant and harmless in themselves, tend to weaken his tolerance, retard his progress and make him more resentful to future treatment, and we can never be sure that he will not continue to need it at intervals for the balance of his life. Also our program should be so arranged that the depressing effect of mercury may be offset from time to time by the tonic action of asphenamine, and any collateral treatment employed to improve his physical condition. I am not forgetting such problems as the patient with a badly damaged liver who cannot take mercury, or the victim of a progressive eye or nerve lesion which responds only to asphenamine. These and others are

individual problems, which must be solved individually.

No routine plan of treatment not susceptible to prompt and wide variation would seem wise at this time, because our late syphilitic patient has a narrowed margin of safety, not always well defined, and we must adjust our treatment to a workable basis which will strike a balance between his physical handicaps and his therapeutic needs. This calls for much more moderate treatment than was the case earlier, because now we need to utilize the immunizing rather than the sterilizing properties of the arsenicals, which is brought out by their intensive use. Moderate treatment is by no means synonymous with unsystematic or desultory treatment, especially single injections at varying intervals, a procedure which must always be regarded as harmful. The patient who is allowed to arrange his own plan of treatment is seldom likely to receive much benefit from it. It is well to extend about the same amount of treatment that he would receive earlier over a longer period. The size of the dose and frequency of injection to be reduced to conform to our estimate of his tolerance, and the mercurial periods lengthened. As time goes on the courses may safely be separated by longer rest intervals, until observation may be all that he needs. It is generally well, I think, to exceed somewhat his apparent needs, but it is as important to know when to stop and watch as it is to know when to start and how to proceed. The medical treatment of late syphilis is inseparable from its economic and social management, which is often the larger and more perplexing problem. Regulation of his work and habits is distinctly a part of our duty to him.

In early syphilis the relief of symptoms has but little direct relation to the success of our treatment, but in late syphilis it becomes one of our most dependable guides. It is often a far better criterion of the effect of our theraphy than is a temporary reversal of the Wassermann reaction, which while gratifying to us, and anxiously awaited by the patient, will serve us better if regarded as a symptom, and subject like other symptoms to periods of remission and relapse. I cannot but feel that, like the tuberculous patient, his future is safer if he be advised in terms of arrest, of readjustment of habits to capacity, of the need of frequent examination and of possible relapse.

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The Value of Routine Physical Examination*

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Economy requires insurance for the sake of the welfare of posterity. In the limited sense of the word this expression is interpreted to mean a provision for the livelihood of the widow and orphans in case of accident, sickness or death of the bread-winner. It has, however, a much broader application, since it embraces all measures which will improve the health of the individual, not only as it bears upon himself but on his nation as a whole.

Osler states "sanitary science, hygiene or preventive medicine may claim to be one of the brightest spots in the (medical) history of the nineteenth century."

That this nation is becoming physically degenerate is a statement, neither fair nor true. It is a fact, however, that the perfect physical type is far too infrequent at the present date. The draft board reports during the recent war showed such a percentage of rejections for physical unfitness as should have stirred the medical profession as a whole to enquire into its cause and plan a line of effort for its remedy.

This fact stimulated in me the idea of establishing a clinic, the sole object of which was the routine examination of those supposedly well. This was started in the winter of 1919 and I am able to quote the results of our first thousand cases.

This clinic consists of a group of four specialists, the internist, the laryngologist, the oculist and the pathologist. Just as any finished manufactured product should be submitted to the several departments in the factory, so is the individual "tested" to note his soundness in all respects. We are not limited to these four specialists, since the whole facilities of the Dispensary are placed at our disposal in case further consultation be needed. It seems wise to give you some idea of its mechanism that you may appreciate its scope and the results which its application have yielded.

Such an examination is offered in the Health Clinic to working people of very moderate means by the Boston Dispensary. Its operation in the evening affords the working man an opportunity for benefiting by this preventive measure without the financial inconvenience resulting from loss of work.

The feeling that institutional medical practice is endangering the livelihood of the private physician is too well known to call for comment. It is also too broad a subject to be entered into in this specific discussion. I wish to show, however, that any infringement on the rights of the local practitioner is safeguarded against with the strictest caution.

*Read before the Franklin District Medical Society May 8, 1923 and the Cambridge Medical Improvement Society Dec. 18, 1923.

Necessity compels that this clinic be as nearly self-supporting as possible and with this in mind the fee of five dollars is charged for the complete examination. This excludes the usual dispensary class and limits the group to the self-supporting working people, who have heretofore received the scantiest advantages of medical science.

The second precautionary measure to prevent antagonism with the profession lies in the rejection of those who are in reality in a position to obtain similar service elsewhere without an institution.

Lastly it was seen to be essential that the object of the clinic must be that of examination only and that no treatment be given. This is accomplished by informing the individual's physician of our findings and the more intricate advice that would ordinarily be given to the patient.

The only other factor which might be considered unique is the review of each completed case by the internist, who is the natural referee, since he is not prejudiced by the diseases of special organs.

In order to appreciate the significance of the findings in our first thousand cases it is necessary to establish a criterion of health. This has been taken as absence from work because of disability on the average of one week or less a year for the past two years. According to this standard 80% of our clientele can be considered "presumably healthy."

The teaching in our leading medical schools calls for a detailed history and physical examination in all cases. Our history sheet resembles the ballot and embraces all important questions relative to family, past illnesses and habits, with space for a detailed description of any complaint, if such exist.

A study of these histories, taken in conjunction with physical findings leads one to the following conclusions. Family history is of very little value, except in the case of personal contact with Pulmonary Tuberculosis and possibly in certain of the familial diseases. Previous history has only very limited value, except in well recognized etiologic instances such as exist between "Rheumatic Fever" and Endocarditis or Idiopathic Pleurisy and Pulmonary Tuberculosis.

The habits are, however, in my opinion of the greatest importance from the standpoint of preventive medicine. "Indigestion," so called, is our most common New England complaint. This fact is substantiated by the following per cents:

Rapid Eating	51%
Deficient fluid intake	52%
Excessive meat ingestion	29%
Deficient exercise	33%
Constipation	46%

Of those cases giving a history of indigestion 85% were either rapid eaters or constipated or suffered from both complaints.

The importance of exercise and recreation cannot be over estimated. Over 30% showed deficiency along the latter lines. This seems of great importance as a predisposing factor of bodily as well as nervous disorders.

FACTORS PREDISPOSING TO DISEASE

Considerable attention has been directed of late years to the importance of obesity in connection with incipient diabetes and with the elevation of blood tension. The malnourished individual is more prone to infectious disease than the average person. In this connection let us note our findings:

Obesity	24%
Undernutrition	22%

In other words only 54% showed within wide limits an average normal weight for age and height.

Dental caries was encountered in 18% and pyorrhoea in 15%; either or both conditions in 29%.

ORGANIC DISEASE

The following table shows the prevalence of organic disease in the 80% presumably healthy clientele;

MEDICAL CONDITIONS:		
Cardiovascular:		
Organic heart affections		11%
Arteriosclerosis (including renal sclerosis)		17%
Hypertension, as an entity (often included under other headings)		18%
Constitutional Diseases (Goitre, Asthma, Syphilis, etc.)		15%
Lung affections:		
(Primary)	7%	
(Secondary)	6%	13%
Nervous Diseases		6%
Skin Diseases		7%
SURGICAL CONDITIONS:		
Herniae		7%
Hemorrhoids		10%
Varicose Veins		13%
Abdominal Diseases (appendicitis, gall bladder and organic gastric disease)		4%
SPECIAL SURGICAL CONDITIONS:		
Orthopedic diseases		38%
Genito-urinary diseases		7%
Gynecological diseases		6%
Ear, Nose and Throat diseases		66%
Diseases of the Eye (chiefly refraction)		80%

With the exception of the special sense organs the defects are not, taken individually, alarmingly high. As a composite, however, the picture is distressing. Not more than 10% of the "healthy" group are exempt from the list.

In addition to the imperfections detected by physical examination are those found by chemical and microscopic methods in the laboratory. Positive Wassermann reactions were found in 3%, Secondary Anaemia in 3%, Albuminuria in

significant quantities in 3% and Sugar in the urine in 1.4%. Careful consideration must be paid to such cases in order to determine the significance of such pathological findings.

UNDUE APPREHENSION

Fully as important as the recognition of organic disease, is the assurance that such a careful investigation can give to an apprehensive individual that his condition is not serious. The knowledge of the existence of a "trace of albumin," "a murmur in the heart," or a "floating kidney" has been the source of anxiety in scores of misinformed people. Careful study may serve in many instances to dispel the cloud under which they have lived. Where actual disease exists it is generally to the advantage of the sufferer to be acquainted with his limitations; it is cruel to handicap the other class needlessly.

In a word our investigation has shown the importance of faults in habit and hygiene; the existence of factors predisposing to organic disease: a surprisingly high percentage of actual organic trouble: and a boon given to the apprehensive individual by the knowledge that his fears were groundless.

These findings are by no means simply of academic interest. The errors of habit and hygiene can be eliminated, the factors predisposing to disease almost entirely corrected and the organic disease nearly always modified and in many instances definitely cured.

Although interest in the Health Clinic prompts this exposition the underlying principle of routine physical examination is the keynote of this paper. Whether it is possible to handle the problem by means of group examination, as has been carried out in our clinic, or by the individual practitioner unaided except for such consultation as he may consider necessary in the specific case; the salient fact remains that health is safeguarded and organic disease detected in the early and often remediable stage if such procedure were only preached and practiced by the medical profession.

Such suggestions must emanate from within the profession. The public is ready for this, since preventive medicine is the foremost topic of most of our popular medical literature

Information Relating To the Importance of Vaccination Against Smallpox

At various times the suggestion has been made that a concise statement relating to the importance of vaccination should be available for reference and distribution.

Dr. Eugene R. Kelley, Commissioner of Health, has prepared the material which the journal presents below. Reprints of this article will be available and may be obtained on application to the State Department of Public Health.

VACCINATION AGAINST SMALLPOX

Compulsory vaccination against smallpox is neessary; it is safe; it is an individual boon and a public duty; and it is the one sure means of protection against this dreaded disease.

1. *What is Vaccination?* Vaccination is the introduction into the skin of the virus of vaccinia or cowpox, causing a local eruption and benign constitutional reaction which result in protection against smallpox.

2. *Vaccination is Necessary*: Virulent smallpox is always endemic in Asiatic countries, and also in various countries of Europe. This country is exposed to the introduction of this disease through our ports, because the incubation period of the disease is in many cases longer than the duration of the sea voyage. Virulent smallpox has been introduced into this country on several occasions in this way.

Smallpox is endemic in the United States, and while the majority of cases are of a mild type with a low fatality, the virulence of the disease has increased several fold in the past five years, and there have been outbreaks of a virulent form of the disease in several states.

3. *Vaccination is Safe*: Since 1902 all vaccine virus produced in this country is subject to the rigid regulations promulgated by the Hygienic Laboratory of the United States Public Health Service. All steps in the process of manufacture and of testing of this product are specified by the Hygienic Laboratory. All manufacturing establishments are subject to inspection by the Federal authorities, and from time to time these authorities examine the products of all the laboratories for harmlessness and potency.

Vaccine virus as it is produced to-day contains the virus of vaccinia or cowpox propagated on the skin of healthy calves and is a highly refined and harmless prophylactic agent. If vaccination is properly performed and the vaccination site is properly cared for, the danger attending its use is negligible.

4. *Vaccination is a public duty*: Experiences all over the world show that vaccinations properly made and resulting in successful "takes" give a high degree of individual protection against smallpox. One successful vaccination gives, as a rule, complete protection for a period of five to seven years, while two successful "takes" usually confer a life-long immunity to this disease. A person vaccinated once and at a later time contracting smallpox, as a rule contracts the disease in a less serious form (varioloid) than unvaccinated persons.

Vaccination should be performed on all persons in the second six months of life, again at school age and also at the time of an epidemic. A review of the statistics of all countries, and particularly of the various states in the United States of America, shows that the number of smallpox cases is in direct proportion to the number of unvaccinated persons. Therefore, it becomes a public duty of every person to be vaccinated.

That the laws requiring the vaccination of all children as a requisite for school attendance violate no constitutional rights of the individual, is a decision of the highest courts of this country.

5. *Universal vaccination is the most successful means available for preventing smallpox*: The claim that general sanitation and that isolation of smallpox patients are sufficient to control smallpox is fallacious. Smallpox appears in some of the most sanitary communities and among people of strict hygienic habits; on the other hand smallpox can be controlled by vaccination even in the most insanitary districts. Isolation while desirable and helpful can not alone control smallpox, because many cases are not detected and isolated until they have had an opportunity to spread the disease to others.

A study of the smallpox situation in this country and a review of the laws relating to vaccination and their enforcement in the various states show conclusively that the best vaccinated states have the least smallpox. Massachusetts with its compulsory laws and with its free distribution of vaccine virus enjoys an almost complete freedom from this scourge. Other states in which there are no compulsory vaccination laws, or in which such laws are not enforced or have been repealed, have smallpox as an endemic disease, with cases running at times into the thousands.

Because of the long continued freedom from this disease, and of the mildness of the majority of cases, many people feel that smallpox no longer possesses its old-time menace, and they, therefore, have become indifferent to the value of vaccination. Hence, it is all the more important that every effort be made to maintain the present vaccination laws on the statute books, and to encourage the people to be vaccinated. Any relaxation of enforcement and any steps which would result in a larger proportion of unvaccinated persons in our communities, would inevitably invite the invasion of and spread within our communities by this great pestilential scourge.

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THE ANNUAL MEETING OF THE AMERICAN CHILD HEALTH ASSOCIATION

THE second annual meeting of the American Child Health Association will be held in Kansas City, Missouri, October 15, 16 and 17 in the Grand Avenue Temple. Several meetings will be held in conjunction with the Kansas City Clinical Society which will also convene that week.

Dr. Borden S. Veeder, Professor of the Clinic of Pediatrics, Washington University, St. Louis, Missouri, is chairman of the program committee for the American Child Health Association annual meeting. Members of Dr. Veeder's committee are: Miss Sara B. Place, R. N., superintendent of Infant Welfare Society, Chicago, Ill., Miss Maude A. Brown, director of Health Education of the Child Health Demonstration, Fargo, N. D., and Dr. S. Josephine Baker, consulting director in maternity and infancy and child hygiene of the Children's Bureau of the United States Department of Labor. Dr. Baker is known as one of the foremost authorities in the nation in the field of child health. Her resignation last spring from the position of director of the Bureau of Child Hygiene of the New York City Department of Health came after twenty years of pioneer work for the welfare of mothers and babies.

Dr. Frank C. Neff of the Kansas City Pediatric Society is local chairman of arrangements for the convention and he is being assisted by a committee of citizens representing local organizations. The meeting in Kansas City will bring together the lay members of the American Child Health Association and an eminent group of physicians, nurses, public health specialists, deans of medical and dental colleges of the leading universities of the country, nationally known educators, nutritionists, biologists and specialists in various scientific fields connected with child health investigation.

SMALLPOX IN THE UNITED STATES IN 1923

THE Metropolitan Life Insurance Company reports that smallpox conditions in this country are improving.

There were fewer cases and fewer deaths in 1923 as compared with 1922.

In forty-two states and the District of Columbia there were 215,943 cases and 163 deaths. In 1920 there were 108.835 cases and 514 deaths.

In eight provinces of Canada there were 1383 cases with three deaths in 1923.

The states of Michigan, North Carolina and California had more than 2000 cases each during 1923. Michigan and North Carolina had 13 deaths from this disease. California had only one.

Even with this diminished mortality, health officials are fearful of less favorable conditions during 1924 for smallpox is prevalent in Michigan, California and Georgia.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY
RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.
F. M. PAINTER, ASSISTANT EDITOR

CASE 10181

An American shoe cutter of forty-six entered February 2 complaining of prostration and pain in the chest in the region of the lower four ribs in the right back.

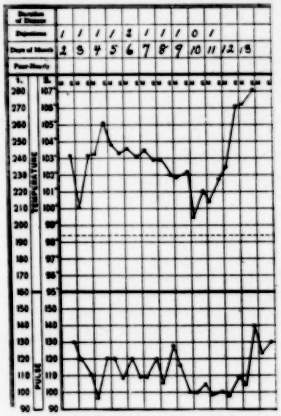
F. H. Unimportant as far as known.

P. H. He had always had good health. He thought he had had all the minor diseases of childhood. A year ago an abscess in the rectum was lanced by a physician without ether. Two days before the onset of the present illness a dentist drilled a hole in a painful tooth to let out pus. The patient thought he was rather nervous. Eighteen years ago he weighed 135 pounds, his best weight. For ten years he had weighed 125.

P. I. Six days ago he had malaise and "a feeling of congestion in his bronchi" which he attributed to a cold, although there was no cough or discharge. Two days later his hands were lame and sore. That evening he vomited and had a chill. The next morning he had pain under his right shoulder blade and began to cough and raise small amounts of thick white sputum. A physician gave him some brick colored powder which the patient thought made his urine red the next morning. It had been high colored ever since. January 31 and February 1 the cough became worse and he had rusty sputum. The pain under the right shoulder blade persisted until the morning of February 1, when it stopped. Since then he had had pain in the right costovertebral region only when he moved about in bed. He had taken nothing but an occasional glass of milk for four days. His bowels had been kept open by "licorice powder" given by his physician. For forty-eight hours he had urinated about once an hour. He had had some difficulty in breathing. The morning of admission his prostration was increased.

P. E. A thin, ptotic man lying flat on his back, breathing rather rapidly. Chest expansion much greater on the left. *Lungs.* Entire front chest and left back clear. Dullness, loud bronchial breathing, increased vocal and tactile fremitus, much increased whispered voice, and rare consonating râles throughout the right back. Apex impulse of the *heart* not found. No enlargement to percussion. P_2 greater than A_2. No murmurs. *Abdomen.* Slight spasm in the right upper quadrant. Liver dullness from the sixth rib; edge felt below the costal margin. *Rectal examination.* Small external hemorrhoids. *Genitals, extremities, pupils* and *reflexes* normal.

T. and P. as shown in the *chart.* R. 33-60. *Urine.* Normal amount, sp. gr. 1.020-1.026, the slightest possible trace of albumin at two of four examinations, rare hyalin casts, once with cells attached. *Blood.* Hgb. 80%, leucocytes 28,000-10,000, polynuclears 89%-96%, platelets markedly increased at one examination, slightly at another; moderate achromia at the first examination. *Two Wassermanns* strongly positive. *Blood culture* at entrance negative. *Sputum.* February 2. Mucoid material with several small areas of red brownish purulent material. Smith stain showed polynuclears, occasional phagocytes, rare red blood corpuscles, occasional Gram-positive spindle-shaped diplococci and rare streptococci in a short chain; no intracellular organisms. By mouse test type II pneumococcus, atypical. Agglutination and precipitation only in type II serum undiluted. One of three later specimens was blood streaked and showed streptococcus mucosus capsulatus.



Orders. February 2. Individual precautions. Soft solid diet. To be fed. Force fluids. Russian oil ℥ ss t. i. d. Veronal gr. x, repeat once if necessary if restless. If not effectual morphia gr. 1/6 s. c. and every three hours p. r. n. for comfort unless respirations below 18. Aspirin gr. x. Veronal gr. x. February 4. Morphia gr. 1/6 s. c. (Three doses.) Digitalis gr. iss daily. February 5-11 inclusive morphia in

1/12 grain doses once a day to every four hours p. r. n. February 5, 7 and 11. Veronal gr. x. February 7. Russian oil ℥ ss b. i. d. Castor oil ℥ ii daily, in capsules if necessary. February 13. Digifolin one ampule given twice. Pituitrin one ampule.

The night of February 3 the patient was slightly delirious and tried to get out of bed. The following night the pulse and general condition were good, although the temperature was higher. February 6 there was a pleural friction rub in the right axilla and at the right base. He complained of pain. February 7 the right lower lobe was resolving. The friction rub persisted. The right chest anteriorly to the level of the third rib showed dullness, bronchial breathing, increased vocal and tactile fremitus, a few coarse inspiratory râles. The night of February 9 he was slightly delirious. The morning of the 12th the condition was very poor. He did not respond to questions. There was no change in the lung signs. He was incontinent of urine and feces. That night the condition was much worse. There was slight bilateral Kernig and double sustained ankle clonus. The knee-jerks were lively and equal. A blood culture showed pneumococci. The blood pressure fell from 120/70 February 12 to 80/50 February 13. That day the patient died.

Discussion

by dr. richard c. cabot

NOTES ON THE HISTORY

1. The old idea that ischiorectal abscess means tuberculosis has broken down with better understanding, and to-day I should say that only a minority can be shown to have any relation at all to tuberculosis. Most of them come from a septic pile, a septic phlebitis of the rectum, and do not differ from other abscesses except that they are kept going by the necessary passage of feces over them.

2. There are two suggestions of a septic focus here, one in the rectum and one in the teeth; we carry this fact over into our thought about the present illness.

3. I have never known pain in the back to be a symptom of pneumonia. I do not know why it should not be, but so far as I have seen, when we have pain in that region it does not make us think of pneumonia nearly as much as of certain other things. This pain apparently had no relation to cough.

4. The suggestion we get from the present illness is of a general infection which shows itself here and there and by various symptoms, but which has more to make us think of the region of the right kidney than of any other particular lesion. The frequent urination, chill, vomiting, sore hands, cough, I take to be all evidences of a general infection.

NOTES ON THE PHYSICAL EXAMINATION

The lungs give exactly the signs of pneumonia, though I have been saying from the pain that I do not think that suggests pneumonia. We are still not sure that it is pneumonia, because lesions below the diaphragm with a high diaphragm sometimes get mistaken for pneumonia.

This is a perfectly possible chart for pneumonia, though the last three days of it look like some complication if it is pneumonia. Of course it would go equally well with some other infection.

He had the sort of treatment they would give if they thought he had pneumonia—not the sort of treatment they would give if they thought he had a sepsis.

DIFFERENTIAL DIAGNOSIS

I do not see what we can say except pneumonia with a complicating and terminal meningitis. We have to remember that it is impossible to be sure clinically of a diagnosis of meningitis as contrasted with a diagnosis of meningismus, in which we have Kernig, stiff neck, sometimes an actual increase of cells in the spinal fluid, but without anything which the pathologist is willing to call meningitis, anything more than congestion of the brain post-mortem. I should say that in the long run perhaps we shall be able to recognize this as a stage of the disease, but I do not know that anybody has yet definitely said that.

The only chance of our being far wrong is from some lesion below the diaphragm, e. g., perinephric abscess, which does not seem at all probable. In the first place, people do not die as quickly as that with any such disease, so far as I know. Also I have never heard of meningitis or of meningeal symptoms complicating such a lesion.

We got out of his sputum and later out of his blood a pneumococcus, and I think that is sufficient to rule out other diseases and to say this is a pneumococcus infection, first of the blood stream, then of the lung, then of the brain, whether with definite meningitis or only with congestion we cannot say. If he had lived a little longer undoubtedly they would have tapped his cord and got information there.

When one says pneumonia it generally turns out post-mortem to be more extensive than one thinks. That is to be remembered here.

Especially when we have two different parts of the body apparently attacked by an infection like this, one thinks of the heart as a distributing center, that is, of an acute endocarditis, which as our post-mortems show is not at all uncommon in fatal pneumonias. But here

we can only mention it. There are no signs on which we can base anything more than a guess.

DR. JAMES B. AYER: What would be your feeling about the possibility of infection's starting with the drilling of the tooth two days before the onset of the septicemia?

DR. CABOT: My guess would be that it has nothing to do with it. If we consider the enormous number of those drillings which are done we should naturally expect this to happen much more often if an infection could start in this way. I feel that the relation of the teeth to general conditions is greatly overestimated. We have got into the way of saying "teeth and tonsils" as a single phrase; because the tonsils certainly have a relation to general infections we go on the assumption that the teeth have. It does not seem to me that the teeth have held their place as a source of general infection.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Lobar pneumonia.

DR. RICHARD C. CABOT'S DIAGNOSIS

Pneumococcus septicemia.
Lobar pneumonia.
Terminal meningitis.
Acute endocarditis?

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

Septicemia, pneumococcus.

2. *Secondary or terminal lesions*

Focal pneumonia and abscess of right lung.
Acute leptomeningitis.
Edema of lungs.
Acute pleuritis, right lung.
Acute endocarditis of mitral valve.
Soft hyperplastic spleen.
Infarct of spleen.

3. *Historical landmarks*

Chronic pleuritis.
Obsolete area of tuberculosis, apex of left lung.
Luetic aortitis.
Arteriosclerotic degeneration of the kidneys.

DR. RICHARDSON: Was a Wassermann done?

DR. CABOT: Yes, two Wassermanns were positive. I should have discussed that. Nothing in the physical examination or in the history, it seemed to me, gave us any reason for saying syphilis merely because of those Wassermanns. We cannot connect it with his death in any way.

DR. RICHARDSON: There was an acute leptomeningitis present, and rather peculiarly distributed. It was spread over the frontal lobes and the parietal, ceasing abruptly in the region of the anterior margins of the occipital lobes, and with but little good evidence of any meningitis at the base.

The skin and mucous membranes were pale. There was no fluid in the peritoneal cavity. The trachea and bronchi contained a large amount of coppery red frothy fluid. The mucosa was slightly reddened.

A short distance below the apex of the right lung there was a focus of gray-red to gray pneumonia with exudate on the pleura. In the lower part of the lobe just beneath the pleura there was another area of consolidation in which there was a small abscess. There were no areas of consolidation in the middle lobe, but in the upper part of the lower lobe there was a focus of red pneumonia. The tissues elsewhere were dark reddish, yielding a large amount of bloody frothy fluid.

On the left side in the apical region there was a small area of obsolete tuberculosis. The tissue of the upper lobe showed considerable edema. The lower lobe tissue was dark red and generally spongy. There were no definite areas of consolidation in this lobe.

The heart weighed 250 grams. The myocardium was a little lax. The cavities showed slight dilatation on the right. The mitral valve was 9.5 cm. in circumference, and showed scattered along it several small brownish soft vegetations. There was no definite evidence of chronic endocarditis, and the microscope showed the vegetations to be recent. That is, acute endocarditis of the mitral valve.

In the ascending thoracic portion of the aorta there was a strip of definite luetic aortitis. The process faded out when it reached the arch, and the remaining portion of the aorta showed only a slight amount of fibrous sclerosis.

The spleen was slightly enlarged and showed a large infarct.

The kidneys combined weighed 325 grams and showed a few foci of atrophy and a little arteriosclerosis.

Fom the heart blood we recovered the pneumococcus.

DR. JAMES B. AYER: This is the only clinical case I have seen in which the meningitis is apparently so early that we do not already have generalized distribution of the exudate. Of course we get pockets of exudate in chronic cases, but that is different. This is an acute case in which apparently organisms could have traveled in the subarachnoid space, but have not yet done so, or at least if the oganisms are widespread the exudate is not. That is very interesting in connection with the paths of septicemias in hematogenous meningitis.

It so happens that in 1919 I was given the problem to work out in animals the path of infection in hematogenous meningitis. In studying sections I came to the conclusion that while it was not certain, it was highly probable, that the infection was over the convexity in the animal, for the reason that we found the organisms and exudate there earliest, within perhaps two hours after the introduction of the organisms into the blood stream. In these cases the ventricles were not affected, so far as one could judge by pathology, as early as the subarachnoid involvement.

This case, then, seems to check up from the clinical point of view the hypothesis that the infection of the meninges in septicemias is over the convexity. That brings up the question of how the organisms get through. That of course was not demonstrated here or in the animals. One hypothesis is that the route is the reverse of what we think we know about the method of absorption from the subarachnoid space, namely, that the fluid leaves by the arachnoidal villi, a thin membrane which connects the venous sinuses with the subarachnoid space. Here we have to assume that there is a back pressure in some way—perhaps venous pressure is enough to do it—and that the organisms in some way go through with this back pressure. The other route through which organisms are supposed to come from the blood stream is the choroid plexus. The animals did not show pathology so quickly in the choroid plexus as in the subarachnoid space. This patient had a turbid fluid, but we do not know details about it. If the organisms were there they should have gone to the cisterna magna and given a basal meningitis first, and they did not, as the base was practically free. Therefore while the organisms may have gone though the choroid plexus in this case, the exudate, which is probably a safe guide, is primarily over the convexities, and this is what seemed to be the point of origin of hematogenous meningitis in the animals.

DR. CABOT: When you say "infection coming through the choroid plexus"—how does it get there?

DR. AYER: The choroid plexus is a very vascular affair—some call it a gland. Some substances come through—iodin comes through—but most things do not. It is perfectly possible that engorgement of the vessels of the choroid plexus would allow organisms to come through, and of course frequently we find the organism there and the question is whether it came through or has backed up from the subarachnoid space.

DR. CABOT: You mean that there are two hematogenous routes?

DR. AYER: I mean that there are the two chief hypotheses to explain the infection of the meninges from the blood stream. Of course it has a good deal of therapeutic importance whether infection appears first in the ventricles or in the subarachnoid space.

DR. CABOT: In ordinary meningitis isn't the hypothesis of infection through the nose losing credit?

DR. AYER: It is in my opinion.

DR. CABOT: Have you speculated at all why the convexities should be the site in which the infection first appears?

DR. AYER: Apparently there are more arachnoid villi there, and these villi are of course very thin membranes between the blood and the spinal fluid; if organisms pass through these villi the convexities near the longitudinal sinus should show the first traces of infection.

DR. CABOT: Have you any views as to the propriety or impropriety of the term "meningismus"?

DR. AYER: Yes, I have decided views. I do not think we should make a diagnosis of meningitis until we have the organism. The fluid may look alike otherwise. Two years ago at the Eye and Ear Infirmary we had a case in which the fluid was frank pus, but we could not find the organism; this patient got well. I do not believe he ever had bacterial meningitis. It was simply an exaggerated form of aseptic meningitis.

One more point experimentally. It is very interesting how a number of procedures will cause the organisms to come through from the blood stream into the subarachnoid space. Just drawing off the fluid rapidly will turn a septicemia into a meningitis, where if that procedure was not done we should not get meningitis. Simply jugular compression will do the same thing. I am wondering if there is any clinical analogy. I refer especially to trauma as a possible cause of meningitis.

DR. CABOT: Does this work of yours make you feel that we are a little too quick in tapping the spinal cord sometimes?

DR. AYER: No, I think not. We have hunted hard and tried to find clinical cases, but we did not find any that were a sure proof. The point is this. In order to produce meningitis we have to have a septicemia of the right degree of severity,—enough organisms and organisms of sufficient virulence for the meninges. Also we have to have a sudden change in the venous pressure. In the animals, if we withdraw one or two c. c. the pressure drops quickly from 130 mm. to zero. We seldom have the same factors in man that we can have in animals. But I do think we ought not to take an excessive amount of fluid and should use a needle of small bore.

There is one condition in which I should not advise lumbar puncture, i. e. in a patient with known septicemia due to pneumococcus or streptococcus. I should not wish to satisfy my curiosity as to "meningitis" or "meningismus" in such a case.

CASE 10182

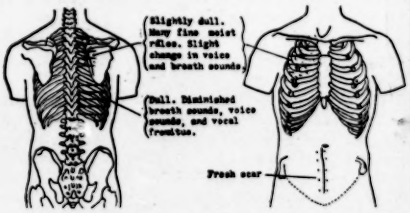
An American housewife of thirty-five entered February 27 complaining of foul diarrhea a year and a half in duration, weakness and loss of appetite.

F. H. Her father died of apoplexy.

P. H. She had had measles, mumps, whooping cough and chickenpox. Otherwise she had always been well until the present illness. Her best and usual weight was 160 pounds, her weight since last summer 128 pounds.

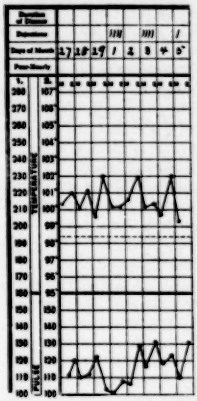
P. I. Eighteen months ago her first pregnancy ended in a miscarriage at six months. About a month later she began to have diarrhea with five or six movements a day with some incontinence of non-formed watery yellow stools of very foul odor. She was troubled with a great deal of gas by rectum and in the stomach. Her appetite was very poor. Food nauseated her. Soon after her miscarriage she began to have severe abdominal pain "as though she were going to burst," and at the same time found that her abdomen protruded when she was on her feet. This would partially disappear when she lay down. Since the miscarriage she had been unable to do any work, constantly grew weaker and lost weight. Five weeks ago she went to a hospital where three weeks ago she was operated upon for ventral hernia. For two weeks she had vomited nearly all the food taken. The vomitus was very sour and bitter.

P. E. A pale, emaciated woman whose skin showed mottled brownish pigmentation. Teeth in very poor condition. *Heart* normal. B. P. 105/85. *Lung* signs as shown in the diagram.



Abdomen slightly distended, tympanitic; slight tenderness all over on deep palpation. *Pelvic* examination. Reddening about introitus. Moderate cystocele and rectocele. *Rectal examination.* Sphincter lax. Rectum ballooned and toneless. *Extremities.* Moderate edema of the feet and lower legs. *Pupils* and *reflexes* normal. Slight external strabismus, right.

T. and P. as shown in the *chart.* R. 20-35. *Urine.* Amount not recorded, sp. gr. 1.022, no albumin or sugar, 2-6 leucocytes. *Blood.* Hgb. 70%-55%, leucocytes 16,400-23,200, polynuclears 82%, reds 4,160,000, showed moderate achromia with slight variation in size and shape, platelets increased. *Wassermann* negative.



Stools. Guaiac positive at one of three examinations. X-rays. Barium enema: see Plate I. Chest: see Plate II.

Orders. February 27. Special diet. Veronal gr. x. February 29 and March 1. Deodorized tincture of opium minims 20 by mouth. March 1. Veronal gr. x. March 2. Codeia gr. 1/2 by mouth every three hours p. r. n. for cough. Veronal gr. x. March 3. Codeia gr. 1/2 by mouth. March 4. Deodorized tincture of opium minims 20 t. i. d. March 5. Caffein gr. x s. c.

The patient was very uncomfortable, had cough, and was unable because of lack of appetite to eat the diet offered her. She went steadily downhill. March 5 she suddenly became cyanotic, and died in half an hour.

Discussion

BY DR. MAURICE FREMONT-SMITH

NOTES ON HISTORY

The story is that of a foul diarrhea lasting for a year and a half in a woman of thirty-five, the diarrhea coming on subsequent to a miscarriage.

There is nothing said about cough.

The possibilities in such a long diarrhea are, (1) infectious diarrhea, (2) malignancy, (3) tuberculosis. If tuberculosis, where the cause? We should expect that she would have had pulmonary tuberculosis primary and given a definite history of cough. This might well have come on at the end of the miscarriage, as we know that pulmonary tuberculosis is lighted up by pregnancy. In the absence of all history of

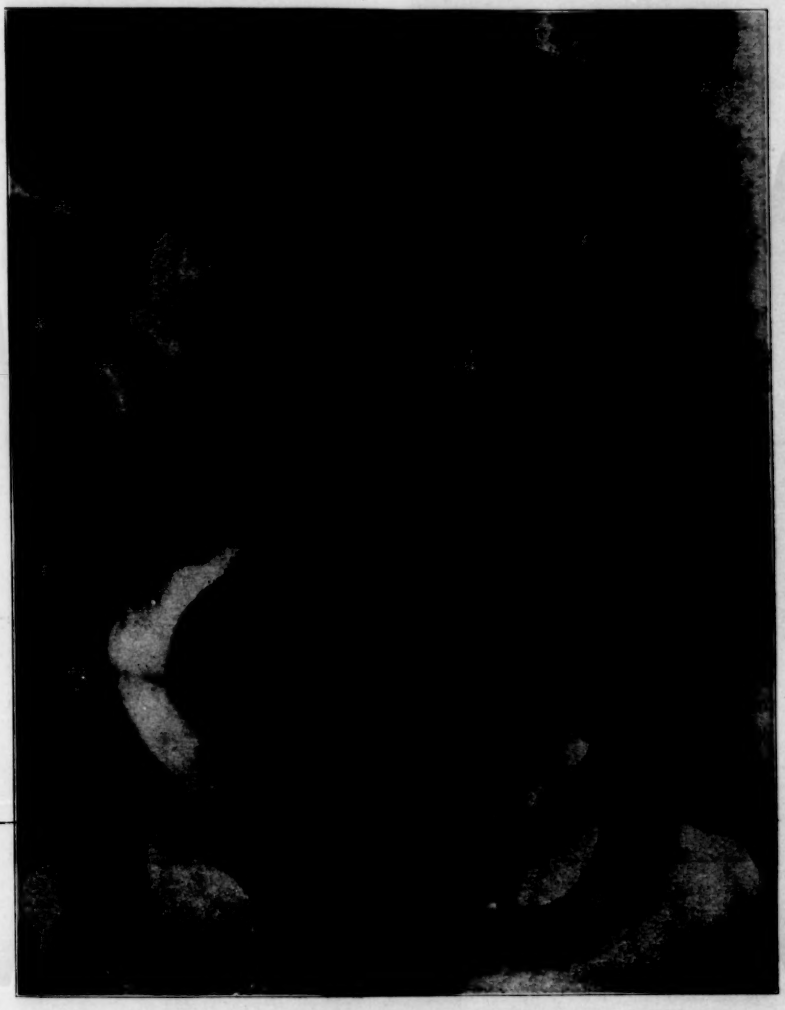


PLATE 1. Barium entered and filled all portions of colon readily as far as proximal portion of ascending colon, and with considerable generalized discomfort. Remainder of ascending colon and cecum filled very slowly, remained constantly narrowed, outline indefinite and devoid of haustral markings. Barium flowed rapidly through ileocecal valve. When pressure of enema was removed this region became immediately empty and cecum and ascending colon presented a coarsely mottled appearance. It appeared to be firmly fixed in position. There was generalized tenderness over the whole abdomen.

cough it seems unlikely that tuberculosis should be the cause.

NOTES ON THE PHYSICAL EXAMINATION

Physical examination shows little except a tender abdomen and some signs in the lungs, signs which might be those of tuberculosis, although with such marked signs in one side we should expect something at the other apex.

DR. MEANS: What did that laparotomy scar come from?

DR. FREMONT-SMITH: That was the repair of a ventral hernia.

The X-ray plate shows a good deal of mottling in both lungs, a shadow in the region of the interlobar septum. This is not the usual picture of tuberculosis, although the calcification must mean the presence of an old tuberculous process.

PLATE II. Hilus shadows increased, with evidences of calcification. Left diaphragm appears normal. Extending toward left apex is an area of coarsely mottled dullness, most marked along the larger bronchi. Right diaphragm high, reaching the seventh rib posteriorly, and very limited in excursion. Costophrenic sinuses clear. Whole right chest diminished in radiance by a coarse irregular mottled dullness. Extending upward and outward from the dome of the diaphragm is a triangular band of greater density. Heart shadow somewhat displaced toward the left.

The external strabismus I think in the light of the present history may be disregarded.

There is no reason to think anything is wrong in the kidneys.

Seventy per cent. hemoglobin is high for either of the two probabilities, carcinoma or tuberculosis. The high white count might well go with either, assuming a necrotic, infected lesion in the intestine.

DIFFERENTIAL DIAGNOSIS

Typically in carcinoma of the intestine one finds obstructive symptoms rather than irritative. The age of this patient, the fact that the guaiac is negative in two out of three observations, argue against carcinoma. On the other hand the fact that we have no definite evidence of clear-cut pulmonary tuberculosis preceding the onset of diarrhea is against a tuberculous

lesion in the intestine. Nor does this X-ray picture confirm a diagnosis of tuberculosis to my mind. I think carcinoma of the cecum is the probable diagnosis.

DR. CABOT: I think I should like to say a word in favor of tuberculosis. I feel as if it was tuberculosis in both lungs and in the region of the cecum. I do not see how we are going to explain that high diaphragm by malignant disease or by anything else that I know except a chronic pulmonary process, which chronic pulmonary process is a great deal more likely to be tuberculosis than anything else. And I think the fact that the left lung does not show more than it does is probably due to its being overdistended. We see how low the diaphragm is there. This is compensatory distention, because there is so little left apparently of function in the right lung. Owing to this distention the shadows in the left lung do not show up as clearly as they otherwise would.

A PHYSICIAN: Would it be fair to ask for a sputum examination?

MISS PARRIS: Sputum examination showed a moderate number of tubercle bacilli.

DR. FREMONT-SMITH: We have to assume then that the history was at fault in not emphasizing pulmonary signs earlier.

NOTE ON THE X-RAY, BY DR. HOLMES

The X-ray examination shows an extensive process in the chest and also evidence of a pathological process in the colon. The process in the chest involves the greater part of the right lung and part of the left. The extremely high diaphragm suggests a partial collapse of the right lung. The character of the shadows in the lung fields is most suggestive of tuberculosis, but could be due to metastatic malignant disease or to a bronchopneumonic process. The appearance in the colon is that of a localized inflammatory or ulcerative process rather more suggestive of tuberculosis than of malignancy.

The question here would be between malignant disease of the colon with metastases to the lung or tuberculosis of the lung with secondary involvement of the colon. The latter is the more probable.

INTERPRETATION OF X-RAYS FEBRUARY TWENTY-NINTH

Findings are those of an extensive pathological process involving both lung fields, more on the right, and a probable pathological process involving the cecum and ascending colon.

BACTERIOLOGICAL REPORT

Sputum. A moderate number of tubercle bacilli.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Tuberculous colitis.

DR. MAURICE FREMONT-SMITH'S DIAGNOSIS

Carcinoma of the cecum.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesions*

   Tuberculosis of lungs with cavity formation.
   Miliary tuberculosis of lungs and liver.
   Extensive tuberculous ulceration of small and large intestine.
   Tuberculosis of the mesenteric glands.
   Tuberculosis of the peritoneum.
   Obsolete tuberculosis of a bronchial lymph gland.

2. *Secondary or terminal lesions*

   Fatty metamorphosis of the liver.

3. *Historical landmarks*

   Chronic pleuritis.
   Scar of laparotomy wound.

DR. RICHARDSON: The peritoneal cavity contained a few cubic centimeters of thin pale clear fluid. The peritoneum however was thickly dotted over everywhere with smaller and larger tuberculous nodules and plaques,—frank tuberculous peritonitis, with only a few cubic centimeters of fluid.

The appendix was wanting. There was an old linear scar pubes up. Above the lower half of the sigmoid and continuously along the descending colon and the transverse around to the cecum were great areas of tuberculous ulceration many of which were typical girdle ulcers. In other places the areas were worm-eaten in appearance. In the region of the cecum there was a very diffuse involvement of the wall. At no place had the ulcers broken through, but at some points they had very nearly done so. Of course opposite the bases of the ulcers there were tubercles on the peritoneum. Beginning from a point thirty cm. below the duodenum the small intestine down to the ileocecal valve was thickly sown with smaller and larger tuberculous ulcerations. The mesenteric glands were markedly involved, and many of them in the periphery of the mesentery were very close to the ulcers.

The anterior margin of the liver was three cm. above the costal border. The diaphragm on the right was at the third and on the left at the fifth.

There was no fluid in the pleural cavities, but the lungs were bound down by old membranous adhesions. The bronchial glands were only slightly enlarged and pigmented, but in one there was a small fibrocalcareous area, the oldest tuberculosis we found. In the apex of the right lung just beneath the adhesions were numerous smaller and larger tubercles. A short distance below there was a cavity three cm. across containing purulent material coverglass from which was loaded with typical tubercle

bacilli. A dilated bronchus led into this cavity. The rest of the lung tissue was sown with tubercles, sometimes appearing in groups, giving a very granular appearance to the section surfaces.

The left lung showed in the apex a few large tubercles, no cavities, but scattered through the tissue numerous smaller and larger tubercles.

The liver weighed 1800 grams, rather large. There were a few old adhesions binding it to the diaphragm, and in the region of the adhesions tubercles. The spleen showed tubercles over the surface but none in the substance. The liver showed fatty metamorphosis and two tubercles. There was mention of some pigmentation in the skin. It was not apparent at necropsy.

DR. CABOT: As you look at the X-ray plate with that extraordinarily high diaphragm on the right,—was it like that as you found it?

DR. RICHARDSON: The diaphragm on the right was at the third interspace, and the right lobe of the liver was bound to the diaphragm by adhesions.

DR. CABOT: Did you find anything corresponding to the transverse shadow?

DR. RICHARDSON: Speculating, it might have been where the tubercles were collected together in places in granular areas, or possibly the adhesions.

DR. CABOT: Was there any special thickening between the lobes of the lung?

DR. RICHARDSON: No; but the lung was bound down by old membranous adhesions. It is a little low I think for the cavity.

DR. CABOT: Did you find the heart displaced to the left?

DR. RICHARDSON: No.

CASE 10183

A Nova Scotian janitor of forty entered January 14.

F. H. Good.

P. H. His general health had always been good. He had typhoid fever at fourteen, gonorrhea and possibly syphilis at twenty-two. His eyes blurred during periods of "biliousness." He had occasional sore throat. For the past year his bowels had been constipated and he had had a dull sense of discomfort in them at night.

P. I. During the past year he had had a number of periods of dizziness lasting from five to fifteen minutes, forcing him to sit down and sometimes but not often associated with headache. About a year ago a very painful lump appeared on his right shin bone. This improved, but during the past month and a half had become larger and redder. Two months ago he began to suffer from constipation. Enemas gave relief, but cathartics made him vomit. The stools were small and hard, very different from his normal movements. Beginning two months ago he passed red urine and urinated once at night. Two weeks ago a Wassermann was positive. A week ago his left leg gave way under him and he fell down and was unable to move the leg for twenty minutes. During this time the leg felt numb; afterwards it was normal. His best weight was 190 pounds, his usual weight 170, his present weight (M. G. H. scales) 148; He had lost fifteen pounds or so in the past year.

The patient gave an impression of some mental abnormality. He did not keep to the point, but wandered in his talk.

P. E. A somewhat emaciated man, up and about, apparently in health. Pyorrhea. *Heart.* Apex impulse in the fifth space at the nipple line. Percussion measurements not recorded. A soft murmur filling the whole diastole heard at the apex. *Lungs* normal. *Abdomen.* Round, tense, and held so rigidly that examination was unsatisfactory. Marked tympany over the whole abdomen. Definite tenderness on deep palpation over the left iliac fossa. A ventral hernia about the size of an English walnut just above the umbilicus. *Rectal examination.* External sphincter somewhat tight. The examining finger encountered a hard mass filling the anterior and lateral aspects of the rectum. The prostate could not be made out. The rectal surface of the mass was smooth and somewhat nodular. No roughening of the surface suggesting ulceration could be made out. The lumen of the gut could be made out dorsally. No blood seen. *Extremities.* On the right tibia was a hard irregular non-tender ovoid tumor about the size of a half dollar, apparently attached to the bone. The skin above this appeared somewhat atrophic. *Pupils.* Right larger than left. Both regular and reacted. Some exophthalmos. Reflexes not recorded.

Before operation T. 96.8°-98.8°, P. and R. normal; amount of *urine* not recorded, sp. gr. 1.020, cloudy at one of four examinations, a very slight trace of albumin at one, leucocytes at three; *renal function* 50%; *blood* not recorded. *Wassermann* negative. *X-ray January* 17. Anterior cortex of the tibia somewhat thickened in the mid-portion of the shaft, with narrowing of the medullary canal in this region. Posterior aspect of the bone is somewhat irregular. Slight amount of forward bowing. *Genito-urinary consultant January* 19. "I do not believe this is malignancy of the prostate and am doubtful if it is of prostatic origin because it lies so far laterally and backward on both sides toward the spine. I believe I can make out a small left prostatic lobe compressed and pushed downward. Would like to know if he has a residual and if catheter urine shows any abnormal cells, red or white. From the history in spite of the negative Wassermann would be strongly suspicious that this is gummatous." *Cystoscopy January* 25. Cystoscope not obstructed or bound in prostatic region. The bladder mucosa

as a whole was unusually pale. On the right just inward from the prostate, involving the lower portion of the right lateral wall, somewhat more than half of the trigone and a part of the lower portion of the posterior wall, there was a stiffened leather-like appearance of the bladder wall. In places it was ecchymotic and might bleed easily. This area was not raised or definitely tumor-like. It suggested more a deep process in or behind the bladder wall. The right ureteral orifice was involved in this area and when catheterized was found to be stiff and immovable as the catheter passed up the ureter. On the left beginning 1 cm. lateral to the left ureteral orifice was a raised area extending up the left lateral wall probably 5 cm. long and half as wide, the long diameter extending up the left side. This raised area was irregular in surface and in places a little ulcerated. It did not involve the mucosa over the prostate, but began just inward from the prostate. Its edges were very sharply demarcated, and the bladder mucosa was apparently normal up to its very edges. This area had the general appearance of neoplasm, but was not so necrotic as one would expect. This fact and the appearance of the other area just described still raised the question whether the process might not be syphilitic. Catheters passed up the ureter easily, and there was apparently no fixation of the ureteral orifice. Both ureters drained normally. Urine from the left kidney, 15-16 red blood corpuscles. Culture showed colon-like bacilli and other bacteria. Urine from the right kidney, 30-40 red blood corpuscles. Culture negative. . . . "Diagnosis could be made by excision of a piece of tumor through the cystoscope. This might cause a good deal of bleeding but we will take the case on transfer and do it if you think another removal of a piece by proctoscope would be inadvisable."

January 28 operation was done. The next day the patient vomited and had considerable pain and moderate distension. A rectal tube was inserted into the colostomy and the sigmoid irrigated, with the escape of gas and definite relief of the pain. January 30 he was still uncomfortable but better. The colostomy was opened with cautery. There was no fecal material and very little gas. It was not discovered until the wound was irrigated January 31 that the proximal end of the gut was at the lower end of the wound. A large amount of feces was recovered with the passing of gas. Next day he was still uncomfortable. The wound was irrigated six times. Enormous amounts of feces were obtained. The wound was septic. The condition gradually grew worse. The colostomy did not drain well. From February 1 to 3 the temperature rose from normal to 101.9°, the pulse ranged from 80 to 120. The wound was irrigated with fecal and gas result. There was much distension. February 4 the abdomen was stiff. February 3 the leucocyte count was 21,900.

February 5 a second operation was done. Next day the patient was failing. He was kept comfortable with morphia. February 7 he died.

Discussion

by dr. hugh cabot

The interest in his previous history turns upon the question of syphilis. The evidence is very incomplete. His present difficulties date back about a year and began with dizziness and the appearance of a painful lump on his shin bone. More recently the picture has changed so as to center chiefly about increasing constipation coupled with slight frequency of urination and possibly with hematuria. The positive Wassermann reported two weeks ago may be said to be important if true. The most recent manifestation of weakness of the left leg may be of considerable importance as tending to fit in with his dizziness and the lump on his shin. His well marked loss of weight is also, of course, of first class importance. If the observation of his mental abnormality is correct it would also be important. One would be interested in having more complete data upon this point.

The examination of the chest raises a slight question of enlargement of the heart, but it is not very definite.

The examination of the abdomen is such as one would expect to find with chronic obstruction in the large intestine. The rectal examination is certainly unusual. Carcinoma of the rectum ordinarily ulcerates early; the intact mucous membrane would importantly weigh against this diagnosis, though it would not exclude it. The story of his constipation and the findings of abdominal distention are not quite in keeping with an obstruction so low down, and suggest that there may be further obstruction at a higher level.

The examination of the rectal mass should be read in connection with the very complete description of the findings by the genito-urinary consultant. As I read these findings they are not those of any form of malignant disease which I have seen, and might fit in with syphilis, though I have not seen this particular manifestation. I think the assumption that the lesion was primarily a neoplasm of the prostrate bulging back toward the rectum and also involving the bladder wall is hardly tenable, since it would have been likely to produce more bladder symptoms, and could hardly be assumed to account for his constipation.

There is no clear evidence of any very important damage to the kidneys, though there apparently is a mild degree of infection on the left side.

Taking the whole picture together I find it difficult to account for it on the assumption of any form of malignant disease. This might ac-

count for the local process, but could not be held to account for the lesion of the right tibia or the dizziness and transient weakness of the leg. The description of the lesion of the tibia seems to me much more like a gumma than any other lesion.

I think there is clear indication for operation here on account of his chronic intestinal obstruction, though I doubt whether the lesion felt by rectum will account for this. As his Wassermann reaction is negative I assume that we should be justified in operating without instituting a course of anti-luetic treatment, though the evidence of activity of the process, if the diagnosis of syphilis be correct, would I think justify one in postponing operation pending a moderate course of treatment. I think I should have adopted this horn of the dilemma and treated him for syphilis, being prepared to deal with his obstruction if it became more troublesome.

I see nothing in the record suggesting a study of the condition of the large intestine with barium enema and X-ray. This would I think have given data of first class importance, enabling one to say with certainty whether the only existing obstruction was that just within the sphincter. This may of course have been done and not recorded.

The evidence at their disposal is apparently more complete than at ours, since they refer to a piece of tissue removed through the proctoscope of which we have no report. This leaves us at a very distinct disadvantage.

The operation if and when done should consist in an exploration, preferably through an incision in the left lower quadrant, to develop the presence or absence of any other obstruction, particularly in the sigmoid, and also the presence of metastases in the pelvic glands or liver in case the lesion should turn out to be malignant.

DR. CABOT'S PRE-OPERATIVE DIAGNOSIS

Syphilis.
Gumma of rectum and tibia.

PRE-OPERATIVE DIAGNOSIS

Carcinoma of prostate.

FIRST OPERATION

Gas and ether. Through a five inch muscle splitting gridiron incision over the deep epigastric vessels the peritoneum was opened, the deep epigastric vessels being ligated. The sigmoid and descending colon were enormously distended. There was a nodular growth surrounding the rectum extending up on the left wall of the pelvis and forward upon the bladder. This was considered an inoperable growth. It was impossible to determine whether the growth was primary in the prostate or in the rectum. No nodules were felt in the liver. Very few glands could be felt anywhere in the pelvis and those felt were not enlarged and were apparently soft. A simple colostomy was done, the peritoneum, fascia and skin being sutured underneath the loop of the sigmoid.

FURTHER DISCUSSION

I note that their pre-operative diagnosis was carcinoma of the prostate, to which they may have been led by the piece of tissue removed of which we have no report. I confess as their description stands I should not have taken this seriously. The indication for colostomy was evidently clear.

His rather early age for carcinoma whether of prostate or rectum probably accounts for the relatively rapid growth of the tumor.

The picture after operation rather suggests peritonitis. It is notorious that these debilitated people, particularly with cancer, will acquire a peritonitis from an operation which would not produce it in more healtny people.

I take it that the second operation was an attempt to deal with a peritonitis, as there is not much evidence of mechanical obstruction and the distention would appear to me to be of the paralytic type.

DR. CABOT'S PRE-OPERATIVE DIAGNOSIS

Peritonitis.

PRE-OPERATIVE DIAGNOSIS

Intestinal obstruction.
Peritonitis?

SECOND OPERATION

Gas-ether. Right rectus muscle splitting incision. The abdomen was filled with cloudy fluid, and in the region of the colostomy there was much thick pus more or less walled off. There were also some adhesions in the region of the growth in the pelvis. Infection evidently came from the colostomy. Two cigarette wicks were placed for drainage. One through and through suture. It was thought unwise to do an additional ileostomy because of the patient's poor condition. The prognosis was considered hopeless.

FURTHER DISCUSSION

The findings at the second operation were as expected, and the further course of the disease normal.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Carcinoma of the rectum.
General peritonitis.
Operations, colostomy, drainage of general peritonitis.

DR. HUGH CABOT'S DIAGNOSIS

Carcinoma of the rectum.
General fibrino purulent peritonitis.

Syphilis.
Syphilitic endarteritis.
Hypertrophy and dilatation of the heart.
Gumma of the right tibia.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

Carcinoma (peculiar) of the rectum with metastases in bladder wall and in retroperitoneal lymph glands.

2. *Secondary or terminal lesions*

General fibrinopurulent peritonitis.
Luetic aortitis.
Edema of the lungs.

3. *Historical landmarks*

Operation wounds.
Slight chronic pleuritis, right.
Chronic appendicitis.

DR. RICHARDSON: The head was not examined. The abdomen was not distended and the wall yielded. In the region of the lower margin of the wound there was some necrosis of the wall and infiltration with pus, which was apparently continuous with purulent material coating the adjoining peritoneum. The peritoneum generally was coated with fibrinopurulent exudate. This exudate extended up over the liver. In the region of the tip of the appendix the wall along the length of 1 cm. was thickened, its canal obliterated, and there were numerous old adhesions about it,—chronic appendicitis.

The stomach was slightly distended. The mucosa was rather pale and flat.

The small intestine was distended. It contained considerable opaque brownish semifluid material. The mucosa was negative. The coils of intestine were stuck together in many places by the purulent exudate. The large intestine was distended and contained considerable rather solid fecal material, and there was considerable similar material in the distal loop of the sigmoid. Near the proximal end of the sigmoid the gut was kinked a little and the wall in this situation over a small area showed necrosis fading out into the exudate on the peritoneum along it. The mucosa of the distal loop of the sigmoid was negative. In the situation of the perirectal tissues and along the lower end of the sigmoid there was a very thick firm layer sheathing the rectum and constricting it. On section the mucosa of the rectum was fairly smooth and showed no definite tumor elevations. The wall of the rectum, however, was thickened up to 1 cm. and the section surfaces showed infiltration with grayish firm new-growth-like tissue. The subperitoneal layer faded out into the thick sheath-like layer which was in places at least 3 cm. in thickness. The layer was continued along the wall of the bladder posteriorly and laterally in the region of the lower half. The bladder wall in this situation was 2 cm. thick and infiltrated with grayish new-growth-like tissue. The mucosa of the bladder showed no definite tumor elevations. The tissue of the sheath was grayish, elastic, homogeneous, and showed in places in the section surfaces small pale gray-blue areas, some of which yielded a little mucus.

The retroperitoneal glands were moderately enlarged and showed infiltration with new-growth-like tissue.

The lung tissue generally showed considerable edema.

The heart weighed 370 grams, of full size, with negative valves and cavities. The coronaries were free. There was more or less sclerosis scattered along the walls, but no definite diminution of the lumen. The aorta showed scattered along it a moderate amount of fibrous sclerosis and some scattered areas of fibrocalcareous change. In the region of the ascending thoracic and scattered along up to the region of the arch there were patches of old syphilitic aortitis. The process did not extend down to the aortic valve and all told was not of great extent.

The microscopical examination confirmed the gross picture.

FURTHER DISCUSSION BY DR. CABOT

I am delighted that the pathologist found an unusual type of carcinoma of the rectum, as the description of the examination is quite different from the ordinary type.

The abdominal findings are as expected. The presence of the luetic aortitis is interesting. I am sorry that they have not given us the findings of the right tibia. This, I think, would also have been found a luetic lesion.

It is an interesting speculation as to whether the luetic background rendered him any more susceptible to carcinoma. I think it is fairly clear that syphilis is a most unfavorable background for a malignant lesion.

NARCOTIC DRUGS

ALTHOUGH legal import of narcotic drugs has declined, the great problem lies in the smuggled drugs.

In 1923 the Narcotic Division of the Internal Revenue Department convicted 4199 out of 4479 prosecutions. There are many cases awaiting trial.

A large shipment was discovered recently amounting to 42,000 ounces of morphine under the designation of glow lamps. Drugs are found concealed in packages containing candy, Cuban jelly, inner tubes and other commodities.

DR. R. H. BLANCHARD, of Pittsfield, who has spent the winter in Florida, reports a rather marked improvement in his health, and probably will be back in his office within a couple of months.

MEDICAL HISTORY

Dr. Alexander Comrie, professor of the history of medicine in the University of Edinburgh, is now in America, on his way to Canada to deliver a series of lectures on "Anatomical Demonstrations." Dr. Comrie recently passed through Boston, and was a visitor at the Boston Medical Library.

New Facts Concerning Salerno

No. 2 of the Research Series in Medical History has recently been published by the Wellcome Historical Medical Museum. The work, by Pietro Capparoni, is entitled, "Magistri Salernitani Nondum Cogniti." There is much new material concerning Salerno, based on the examination and investigation of an ancient manuscript volume found in the Cathedral Church of St. Matthew in Salerno. Many new names have been brought to light of lecturers and students at the school.

The Fourth "Salon des Médicins" was held in Paris on March 2nd-9th, 1924. "Aesculape" recalls the success of the three previous exhibitions of paintings and sculptures by medical men, 1909, 1911, and 1912. A number of pictures from one of the former exhibitions are reproduced in Aesculape, and are of a high artistic merit.

International Society of the History of Medicine. The permanent committee met in Paris in December, 1923, for the purpose of voting regarding the entry of Austria into the society. Voting, were representatives from Belgium, Italy, France, England, Denmark, Spain, The United States, Holland, Poland, and Switzerland. The entry of Austria into the society was unanimously voted. The next congress on the history of medicine will be held at Geneva in July, 1925. The exact title is, "The Fifth International Congress of the History of Medicine." The president of the Congress is Dr. Cumston, Geneva, and the secretary-general Dr. A. De Peyer, 20 rue General-Dufour, Geneva.

An Ivory Anatomic Venus. In the January 1924 number of Aesculape is a most interesting article by Lecaplain on the museum of the Medical School of Rouen, which was created in 1896 by Brunon. Among the most interesting objects is the ivory Venus, pictures of which are reproduced. Lecaplain states that this sort of demountable statue, reproducing the anatomy of the pregnant woman, was quite common in the 17th and 18th centuries. Attention is called to the left arm, flexed at a right-angle over the upper part of the abdomen. This position of the left arm, Lecaplain tells us, has always been considered by artists as the sign of pregnancy in art. It is found in most of the pictures of the Visitation and in the "Donna gravida" of Raphael. The museum also has a specimen of the rare "ceinture de chasteté, or belt of chastity, which was found in Rouen some 12 years ago and restored by Loquet.

Cicatricial Tattooing. The February number of this journal gives a very interesting account of the cicatricial tattooing practised by the natives of the Belgian Congo. The reaction to excessive scar formation and keloid in the negro is well known Aesculape points out and is taken advantage of by the natives in their tattooing by this unique method. The practice of tattooing goes back to the neolithic age. It was practised by the Greeks, in the time of Homer, but was soon relegated to the barbarians, and only used upon the Greek slaves. Pictures are given showing the very striking effects produced by this method. In a Bangala man the face presented a series of arabesques made by the numerous small raised scars, hundreds being placed at exact distances apart. The nature of the design of the tattooing varies with each tribe, and acts as a distinguishing mark.

BOOK REVIEWS

Aids to Practical Pathology. By F. W. W. Griffin and W. F. M. Thompson. Pp. 239. New York: William Wood & Company. 1923.

This handbook of clinical pathology is similar in scope to Stitt's well-known manual, with the addition of blood and urine chemistry. Many of the methods are English and somewhat unfamiliar. A few of our stand-bys, such as Wright's stain for blood, are omitted. The alphabetic list of bacteria with their chief characteristics is of questionable value, the descriptions tending to give an impression of ease and surety of diagnosis misleading to those without bacteriological training. Yet in most respects this manual will be found helpful to those interested in laboratory procedures though with insufficient time to give them careful attention.

The Heart In Modern Practice. William Duncan Reed, M. D., Boston. 352 pages. J. B. Lippincott Company.

A very good volume for reference in general practice. Of particular value is the clear classification of heart disease on an etiologic basis—a feature that is indispensable in the proper treatment of cardiovascular disease. The anatomy, physiology and embryology of the heart are well considered, as are methods of examination, both clinical and mechanical. Of special interest to the student is the consideration of the normal heart. Functional cardiac conditions—particularly the arrythmias—are clearly defined, described, and thus made easy for diagnosis. One is disappointed to find treatment confined to a section of twenty-five pages. The case reports are interesting.

THE BOSTON
Medical and Surgical Journal

Established in 1828

Published by The Massachusetts Medical Society under the jurisdiction of the following-named committee:

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SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States. $7.56 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the printer with galley proof of paper.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The Boston Medical and Surgical Journal, 126 Massachusetts Ave., Boston, Mass.

THE PROMISED CURE FOR CANCER

THE daily papers have announced that Dr. Fichera of Padua claims to have developed a prevention of cancer and promises a probable cure of the disease by the use of sera.

American Medicine for March, 1924, publishes an article by William Held, M. D., of Chicago, in which the claim is made that a similar method of treatment is of value.

While the world is expecting a solution of the etiology of cancer and methods for its prevention and cure, past experience leads to conservative skepticism regarding claims of this nature.

Very few revolutionary theories which have appeared in the daily press have been found to stand the test of scientific investigation. It is true that one great discovery in recent times was heralded in the newspapers before the scientific reports were published but even with the few examples of valuable announcements there have been so many false hopes held out that doubt of the importance of sensational claims is reasonable. We hope that we are on the verge of great discoveries but we still feel that publication of reports of prevention or cure should be postponed until authorities other than the claimant shall have verified the findings. It is not only cruel to raise false hopes but unproved claims may lead to so many importunate requests from sufferers that even scientific investigation may be hampered. We cannot blame the newspapers for the publication of impressive news items. It is the ambition of editors and reporters to be first in the field when important and even vital information is acquired but the ambition for publicity should be tempered with regard for scientific accuracy.

Since the claims for discovery of means for the control of cancer have been published we must wait patiently for the truth and not express opinion in advance of actual demonstration.

SOME COMMON PROBLEMS

DR. O. S. WIGHTMAN, President of the New York State Medical Society, in a letter to the New York Times, acknowledges that there are unworthy men in the ranks of the organized medical profession and claims that the Society should see that these men cease to jeopardize the health of the community. He feels that the prosecution of the unregistered practitioners representing the cults is no concern of the medical profession and that the State through its police organizations should deal with this class of lawbreakers. These contentions are logical but however bitterly we may feel because of the indifference of the state, as represented by the police departments, it may be in order to ask ourselves whether the glass house and the stone throwing may not in a degree apply to the medical profession.

The President of the New York Society confesses to the fact that the profession in that state has not cleared its own skirts and he probably knows the facts. The same condition exists in all states probably. At least we know that it does in Massachusetts. We have had members of our State Society who were convicted criminals. We certainly have one now, and yet the Society has been indifferent in some instances and appears to be so at the present time, although we have the machinery which if put into action would bring results.

It may be that there are some of our members who are not familiar with the provisions of our by-laws. Chapter VII, Section 4, requires that our Committee on Ethics and Discipline *shall* take action upon written complaint by any member of the Society and *may* initiate proceedings if it is so disposed.

These by-laws were adopted for a purpose but one may question, under the present condition, whether the Society feels any necessity for action. Hardly any individual enjoys the distinction of demanding punitive action. Many would reason that since we have a committee for that purpose and the members thereof have accepted the responsibilities the initiative belongs to the committee more than to the individual. This reasoning would be accepted as sound by many

and an ungenerous critic would be quite apt to suggest that if the committee does not function under the authority of the word "may" that the members ought to resign.

The committee, on the other hand, may reply that since there has been no expression of opinion it may be that the Society as a body does not feel impelled to act, but since we have the by-law it may be fair to suggest that if the committee is in doubt a report should be made and instruction sought.

We believe that the major responsibility rests with the committee and we respectfully suggest that action be taken.

A MEETING OF INTEREST

An unusually interesting meeting will be held at the Boston Medical Library on the evening of May 9, under the auspices of the New England Pediatric Society. The meeting will concern itself entirely with the recent important advances made in the treatment of scarlet fever, the speakers being Dr. A. R. Dochez of the Presbyterian Hospital on "Studies on the Etiology of Scarlet Fever," and Dr. Francis G. Blake of the Yale Medical School on "Observation on the Serum Treatment of Scarlet Fever."

In view of the work on this subject published this year by the Dicks of Chicago and Dochez and Blake, this promises to be one of the most interesting and valuable medical meetings held in Boston this year. There is no doubt that the remarkable advances made in the study of this disease, and first made known to the profession during the last few months, constitute one of the notable achievements of this generation, and it is hoped that large numbers will take advantage of the opportunity to hear a first-hand account of the work. The meeting will be open to all who wish to attend.

A WISE JUDGE

In the case of Ernest G. J. Meyer, chiropractor, of Brooklyn, referred to in a previous issue, the court imposed a sentence of from one to two years in Sing Sing for manslaughter in connection with the death of a child suffering with diphtheria whom Meyer was treating according to chiropractic methods.

Meyer evidently expected a minimum or suspended sentence for, according to the New York World, he was smiling when he entered the court room. Most persons would feel little like smiling when in court on a charge of manslaughter. Justice Hagarty properly said:—

"The jury has found that you negligently caused the loss of a human life," Justice Hagarty told Meyer. "You held yourself out as one competent to cure disease.

"Diphtheria is a serious disease. If scientifically treated, however, the ratio of mortality is low. You took the responsibility of treating that case and you have been held accountable for it. You must take the consequences.

"Your conviction will serve as a warning to all parents responsible for children and to adults to have a responsibility to themselves, as well as to all persons who practice medicine illegally."

The editorial comment of The N. Y. Times on this case is as follows:

"Meyer, who calls himself a 'chiropractor,' was summoned by misguided parents to treat a sick child. He performed some of the spinal manipulations which constitute the whole stock in trade of his class. Whatever the result of his exertions may have been, he did not discover that the child was suffering from diphtheria, a disease which almost any sane adult ought at least to suspect before it is far advanced, and a real doctor was not called in until just before the fatal termination. Then there was administered the antitoxin which in all probability would have saved the child's life if resort to it had been timely, but it was too late and the little girl died, a victim of a double ignorance. This to the jurors was manslaughter."

At the hearing before the Public Health Committee of the Massachusetts Legislature a representative of the Boston Medical and Surgical Journal predicted that a similar calamity would sooner or later follow the registration of chiropractors in this State. A remark by a member of the committee indicated that the seriousness of the contention was not realized.

This conviction and the evidence submitted has led to activity on the part of the prosecuting officers of Brooklyn. A drive is on to rid the city of quacks. Under the direction of the District Attorney a tabulation of all unregistered practitioners will lead to prosecution.

Are we to wait for a similar tragic occurrence before Massachusetts will clean house? Some of our police departments are disinclined to act. Several weeks have elapsed since a report was made of the practice of an unregistered man. Up to the time of this writing no action had been taken.

Comparatively recently two chiropractors who, according to their own statements, were practicing illegally in a nearby city were reported to police departments but no action was taken so far as is known.

The Board of Registration in Medicine has reported other cases which seemed to call for investigation at least, without securing co-operation and some cases that have been prosecuted have not been convicted although the evidence seemed ample to the officer and to laymen.

Sensational exhibitions of harm resulting from the practice of unqualified persons are apparently necessary in inciting to action. Must we wait for another inadequately treated child to die before protective legal machinery is applied?

SUFFOLK DISTRICT MEDICAL SOCIETY

The Annual Meeting was held April 30, 1924, at the Boston Medical Library at 8.15 P. M.

PROGRAM

Business: Election of Officers.

Subject of the evening: "X-Ray and Radium in the treatment of non-malignant disease."

"Blood and Hodgkins Disease." Dr. George R. Minot.

"Skin." Dr. Frederick S. Burns.

"Thyroid and Ductless Glands." Dr. George W. Holmes.

"Uterus and Prostate." Dr. L. B. Morrison.

"Eye." Dr. George S. Derby.

The Nominating Committee submitted the following list of candidates for Officers of the Society for the year 1924-1925.

President—C. M. Smith, M. D.

Vice-President—G. R. Minot, M. D.

Secretary—L. H. Spooner, M. D.

Treasurer—John C. Rock, M. D.

Commissioner of Trials—Channing Frothingham, M. D.

Councillor for Nominating Committee—W. H. Robey, M. D.

Alternate—David Cheever, M. D.

Librarian—E. C. Streeter, M. D.

Committee on Supervision—F. W. Stuart, M. D., J. B. Ayer, M. D.

Committee on Social Meetings—A. W. Allen, M. D., L. J. Cummins, M. D., T. K. Richards, M. D., George D. Cutler, M. D.

Censors—R. H Vose, M. D., G. A. Leland, M. D., H. S. Loder, M. D., A. E. Austin, M. D., W. J. Brickley, M. D.

Councillors—S. H. Ayer, M. D., G. M. Balboni, M. D., J. W. Bartol, M. D., R. Bonney, M. D., J. T. Bottomley, M. D., V. Y. Bowditch, M. D., E. G. Brackett, M. D., J. E. Briggs, M. D., M. E. Champion, M. D., D. Cheever, M. D., W. H. Devine, M. D., G. B. Fenwick, M. D., C. Frothingham, M. D., J. E Goldthwait, M. D., W. C. Howe, M. D., J. C. Hubbard, M D., H. Jackson, M. D., F. B. Lund, M. D., D. Macomber, M. D., G. B. Magrath, M. D., R. H. Miller, M. D., J. J. Minot, M. D., T. J. O'Brien, M. D., R. B. Osgood, M. D., E. H. Place, M. D., A. Quackenboss, M. D., E. Reynolds, M. D., W. H. Robey, M., D., J. D. K. Sabine, M. D., D. D. Scannell, M. D., C. L. Scudder, M. D., C. M. Smith, M. D., J. S. Stone, M. D., E. W. Taylor, M. D., L. P. Tingley, M. D., R. H. Vose, M. D., P. D. White, M. D., F. H. Williams, M. D.

R. L. DeNormandie, M. D.
A. H. Crosbie, M. D.
L. Davis, M. D.
J. C. Hubbard, M. D.
Nominating Committee.

DIAGNOSTIC CANCER CLINICS

Clinics for the medical profession illustrating the diagnosis and treatment of cancer will be held in various Boston hospitals during the week of the meetings of the New England Health Institute, May 5th to 10th. At these clinics patients with cancer will be shown, and the diagnosis and treatment discussed in relation to the individual case. The operative treatment of cancer will also be demonstrated. In addition, diagnosis clinics, free to the public, will be held in certain hospitals.

The program follows :

Boston City Hospital: Tuesday, May 6th:
10 A. M. Free Diagnostic Clinic in all Out-Patient Departments.
10-12 A. M. Demonstration of Operative and Non Operative Cancer Cases: Cheever Amphitheatre.
2-4 P. M. Demonstration X-Ray Treatment, Methods and Results: X-Ray Department.

Boston Dispensary: Thursday, May 8th:
9-11 A. M. Free Diagnostic Clinic. Open to the Public.

Peter Bent Brigham Hospital: Thursday, May 8th:
10 A. M. Demonstration of Cases, Illustrating Diagnosis and Treatment of Cancer.
Operative Clinic.
Physicians are invited to bring patients for Diagnosis.

Carney Hospital: Wednesday, May 7th:
10-12 A. M. Operations and Demonstrations of Diagnosis and Treatment of Cancer.

Huntington Hospital: Monday, May 5th:
3 P. M. Demonstration for Physicians of Diagnosis and Treatment of Cancer.
Free Diagnostic Clinic. Open to the Public.

Massachusetts General Hospital: Wednesday, May 7th:
2 P. M. Free Diagnostic Clinic. Open to the Public.
3 P. M. Demonstration, for Physicians, of Diagnosis and Treatment of Cancer.
4:30 P. M. Operative Clinic.

THE MASSACHUSETTS PSYCHIATRIC SOCIETY

By invitation of Dr. George M. Kline, Massachusetts Commissioner of Mental Diseases, about one hundred physicians met in the Hotel Somerset, Boston, April 25, for the purpose of organizing the Massachusetts Psychiatric Society.

After a banquet the meeting was called to order by Dr. Kline who was then elected temporary chairman.

A draft of a constitution and by-laws was presented and adopted.

The object of the society is the consideration of all matters pertaining to Psychiatry with special attention to clinical problems.

Membership is open to those who are members of the National Psychiatric Society.

A nominating committee was appointed by the chairman.

The committee presented the following names for officers of the Society: For President, Dr. W. E. Fernald of Waverley; Vice-President,

Dr. G. M. Kline; Secretary-Treasurer, Dr. R. M. Chambers.

Councillor to serve with the other officers, Dr. Healey of the Baker Foundation and Dr. Packard of the McLean Hospital. These gentlemen were duly elected.

On taking the chair Dr. Fernald made a brief speech, referring to the objects of the organization, explaining that there is no antagonism to the New England or National Societies for there is room for all and more frequent meetings can be held by the State Society. He explained that there is a dearth of properly equipped psychiatrists and that there is a great need of more physicians qualified to work in institutions. He then introduced Dr. William A. White, superintendent of St. Elizabeth's Hospital, Washington, D. C., who spoke for more than one hour, giving a clear statement of the development of psychiatry up to the present time, explaining the defects of certain teachings and finally prophesying among other ideas the central thought that the well trained psychiatrist of the future would be the man who could analyze and correlate the expert findings of the practitioners in the different departments of medicine and thereby serve the patient better than is possible under many circumstances.

The address was a brilliant and logical presentation of the subject and especially of the speaker's personal views.

Dr. Kline has arranged for a report of the address which we hope will be available for publication in this JOURNAL.

OFFICERS OF THE PLYMOUTH COUNTY DISTRICT MEDICAL SOCIETY FOR 1924 AND 1925

At the annual meeting the following named officers were elected:

President—Dr. Joseph H. Lawrence, Brockton.

Vice-President—James H. Drohan, Brockton.

Secretary and Treasurer—Dr. Wallace C. Keith, Brockton.

Commissioner of Trials—Dr. Gilman Osgood, Rockland.

Censors—Dr. Arthur L. Beals, Dr. W. W. Fullerton, Dr. A. W. Carr, Dr. E. J. Beaulieu, Dr. L. B. Reed.

Councillors—Dr F. G. Wheatley, (Nominating) Dr. Wallace C. Keith, (Alternate) Dr. Gilman Osgood, Dr. Nathaniel K. Noyes, Dr. Arthur L. Beals.

ANNUAL MEETING OF THE WORCESTER NORTH DISTRICT MEDICAL SOCIETY

OFFICERS ELECTED FOR 1924-1925

President, B. H. Hopkins, Ayer.
Vice-President, J. A. Barton, Fitchburg.
Secretary, C. H. Jennings, Fitchburg.
Treasurer, F. H. Thompson, Jr., Fitchburg.
Commissioner of Trials, C. H. Bailey, Gardner.
Five Censors, Supervisor, 1, D. S. Woodworth, Fitchburg; 2, T. R. Donovan, Fitchburg; 3, R. A. Rice, Fitchburg; 4, Geo. Mossman, Gardner; 5, F. H. Thompson, Jr., Fitchburg.
Councillors, W. E. Currier, Leominster; A. F. Lowell, Gardner; H. R. Nye, Leominster; D. S. Woodworth, Fitchburg.
Councillor for Nominating Committee, Principal, W. E. Currier, Leominster; Alternate, A. F. Lowell, Gardner.

THE OPENING OF THE AMERICAN HOSPITAL IN LONDON

THE opening of this Hospital, in rooms taken at Hampstead, which was attended by Ambassador and Mrs. Kellogg, Consul General Skinner, and a few of the leading physicians of London, occurred April 9, 1924.

According to a dispatch received by The New York Times the Hospital is housed for the present in a nursing home.

NEWS ITEMS

DOCTOR CHOQUETTE, of Adams, is spending three months in Europe, during which time Dr. W. W. Pascoe is looking after his practice.

DR. CHARLES T. LESLIE, of Pittsfield, is enjoying a three-weeks' motor trip through the middle west. He expects to visit the hospitals of Chicago and Cleveland.

DR. GEORGE H. THOMPSON, of North Adams, has resumed his practice after a most delightful visit in the West Indies.

DR. HARRY G. MELLEN, of Pittsfield, following his recent marriage, spent two weeks in Bermuda, and has now resumed his practice.

MISS IDA J. ANSTEAD, who has been for three years superintendent of the House of Mercy Hospital, has resigned, and has been succeeded by Miss Peck, of Rochester, N. Y., who assumed her duties April 1. Miss Peck has had considerable experience in this work, and has also served as Field Agent for the American Hospital Association.

THERAPEUTIC COLUMN

OUTLINE OF TREATMENT FOR AMEBIASIS WITH SPECIAL REFERENCE TO THE USE OF EMETIN

BY GEORGE CHEEVER SHATTUCK, M. D.

The symptoms of amebiasis vary from those of a severe acute dysentery to the carrier-state in which there may be mild digestive disorder and occasional diarrhea, or no symptoms at all. Many carriers never had dysentery. Before be-

ginning treatment it is important, whenever possible, to make certain of the diagnosis by finding either the motile forms or the cysts of Entameba histolytica. To distinguish these with certainty from non-pathogenic amebae is not always easy, and both kinds may be found together.

Emetin is generally used as the hydrochlorid, from 1/3 to 1/2 grs. being injected intramuscularly twice daily. The drug can be obtained in solution in ampules or in tablets which may be dissolved in about 15 minims of distilled water. The injections generally produce local irritation and pain. To minimize this the injections should be given intramuscularly. Cawston[1], says that pain commonly resulting from emetin injections can be avoided by using reliable preparations only and by dissolving the tablet in 1% carbolic acid immediately before giving the injection. When the drug is well tolerated the course of treatment may be continued for ten or twelve days. Emetin used in this way generally brings the acute symptoms to a rapid close, and it may cause the motile forms of E. histolytica to disappear. It has little effect upon the cysts of this parasite, and it seems not to affect E. coli at all.

The commonest error in the treatment of amebiasis is to be content with a symptomatic cure. The patient then, usually, becomes a carrier liable to relapses of more or less severity, to slight chronic digestive disorder or to abscess of the liver. The danger of liver abscess is greater for those living in the tropics, particularly if they take alcohol freely, than for persons living in a temperate climate. Even should the patient remain free from symptoms he is likely to become a disseminator of infection. For these reasons every effort should be made to complete the cure.

The drug most generally recommended for use after the initial course of emetin hydrochlorid is emetin and bismuth iodide, or "E. B. I.," which contains 26% emetin alkaloid. The usual dose is 3 grs. administered in the evening an hour after the last meal in hard gelatin cachets. In order to prevent vomiting it is generally necessary to prescribe 10-15 min. of Tr. opii to be taken half an hour before the E. B. I. The usual course of treatment with this drug lasts twelve days, after which the patient may be allowed to be up and about for a week. Such a course of treatment may have to be repeated several times in order to complete the cure and, even so, success is not assured. It may be necessary to increase the E. B. I. to 5 grs. daily, 2 grs. being taken in the morning and 3 grs. at night. It is important to watch stools to see if the drug is being absorbed. Jepps[2], using salol-coated pills, had 45.1% of relapses. She then used an emulsion containing 3 grs. of E. B. I. in ½ ounce of liquid paraffin and had only 12.7% of relapses.

As evidence of cure one should have at least six consecutive negative stool examinations made over a minimum period of several weeks. In obstinate cases the patient continues to pass only motile amebae but when cysts only are found the prognosis is better.

It is well to begin treatment with a full dose of castor oil, to prescribe liquids only, for patients who have acute symptoms and, at least, while the treatment is in progress, to keep the patient on an easily assimilable diet leaving little residue. During this period the patient should stay in bed.

Caution is required in the use of emetin hydrochlorid because it has caused a number of deaths. It often produces slight diarrhea which may become intractable, but the serious danger is from disorders of the circulation and nervous system. Fall of blood-pressure, tachycardia, cardiac irregularity, dyspnea, or collapse; extreme muscular weakness, polyneuritis, or bulbar symptoms may supervene, and may be followed by death even a considerable time after cessation of the treatment. Bais[3], described the case of a woman in whom muscular weakness and acceleration of the pulse were not apparent until two days after the last injection. Total dosage in this case was 15 grs. divided into courses of six injections each over a period of six weeks. "Serious parenchymatous degeneration of heart" was found post-mortem.

Another case described by Soca[4], had about the same amount of emetin in nineteen days. Nine days later there was weakness and pain in the limbs with marked tachycardia and dyspnea. The patient improved and seemed almost well, but about six weeks after the emetin treatment bulbar symptoms supervened and the patient died. Fortunately, such accidents are rare. Some persons, moreover, show an idiosyncrasy to emetin and for these one of several other methods of treatment must be employed. It is well not to give more than 10 grs. of emetin in a single course, not to repeat this at short intervals, and not to use the drug intravenously.

Udaondo and Carulla[5], report two cases of polyneuritis in patients in which Ambard's coefficient had shown defective renal function. They ascribed the polyneuritis to defective excretion of the drug even though the intervals between courses of emetin had been six months in one case and one year in the other and although no symptoms of intolerance had been shown previously.

E. B. I. may cause vomiting or severe diarrhea but I have seen no report of deaths from its use.

REFERENCES

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4 Soca, F.: Bull. et Mém. Soc. Med. des Hôpit. de Paris, 1922, May 12, 3rd Ser., Vol. 46, p. 762.
5 Udaondo, C. B. and Carulla, J. E.: Revista de la Asoc. Méd. Argentina. Abstracted: Jour. A. M. A. 1924, Vol. 82, p. 754.

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY

CHARLES E. MORGAN, M. D., *Chairman*
FREDERICK C. IRVING, M. D., *Secretary*

THOS. R. GOETHALS, M. D. *Clerk*,
Boston Lying-In Hospital, Boston, Mass.

(Communications and questions addressed to the Clerk will be welcomed and cheerfully answered.)

Vital statistics for the Commonwealth for the month of February, 1924, exclusive of Boston, show twenty-eight deaths in the puerperal state. These deaths are tabulated as follows:

Ruptured extrauterine pregnancy	1
Hemorrhage	4
Caesarian Section	1
Lobar Pneumonia	2
Ruptured Uterus	1
Acute inflammatory rheumatism with myocarditis	1
Puerperal Septicemia	6
Embolism	5
Albuminuria	7

One of the hemorrhage deaths was due to shock and collapse following miscarriage; another was associated with inversion of the uterus; one was "prepartum" due to separation of the placenta; the fourth was recorded as due to premature detachment of the placenta.

The death attributed to Caesarian section also had bronchopneumonia as a causative factor.

One of the deaths assigned to the heading of albuminuria is recorded as follows: "Puerperal albuminuria, no convulsions, labor not induced. Acute myocarditis induced by follicular tonsillitis. Pyelitis with obstruction." The question arises whether this case should be properly so assigned; the death certificate suggests either heart failure occurring during an attack of tonsillitis, pr pyelitis with ureteral obstruction causing pyonephrosis with resultant death from exhaustion or septicemia; in either case there would doubtless be albuminuria. The death certificate as written is inconclusive and misleading.

In a recent communication the Section has been asked to give information regarding the true incidence of Hydatidiform Mole, the frequency of chorioepithelioma as a sequence of this condition, and the operation of choice in the event that a case has been diagnosed as mole.

The incidence of mole as given by various observers is extremely variable, from one case in 20,000 pregnancies, (Boivin), one in 2,400, (Williamson), to one in 728, (Kronig), or even one in 310, (Mayer). Meyer, of the Department of Embryology of the Carnegie Institute in Washington, found eight cases of mole in 2089 uterine specimens; on the other hand in a study, both gross and microscopic, of 400 early abortions he found 10% which showed evidence of mole formation. Williams and Novak of Baltimore, however, believe that Meyer's observations do not prove his point; that the degenerations described by him followed the death of the embryo and was not a new-growth.

The frequency of chorioepithelioma following mole is also reported within the widest possible limits. Findley reported a 16% incidence. Teacher less than 5%. Meyer emphasizes the fact that the early type of mole described by him is not so likely to produce later malignancy as the more prolonged growth. Williams has seen about twenty cases of mole with only one occurrence of chorioepithelioma.

Regarding treatment of hydatidiform mole the classical method consists in a cereful curettage of the uterus, using steel dilators or gauze packing of the cervix if necessary to obtain dilatation; the use of two fingers in the uterine cavity is best, otherwise a dull curette (never a sharp one for fear of perforation). The operator should be sure that the uterus is empty and should pack in the event of marked hemorrhage. The patient ought to be kept under careful observation for some two or three years afterward in order to guard against chorioepithelioma.

Schumann takes exception to this method in view of the immediate mortality from hemorrhage, sepsis, and malignancy. He advocates abdominal section as soon as the diagnosis is made, with hysterotomy, shelling out the tumor if the uterine wall is not invaded, or doing a supravaginal hysterectomy if areas of invasion of the muscle are present. Williams considers such treatment too radical in view of an incidence of subsequent malignancy of only 5%, and believes that the other dangers are due to faulty technic. Vineberg also considers Schumann's stand too radical, and advocates vaginal hysterotomy as the method of choice for insuring complete emptying of the uterus and avoidance of hemorrhage.

From the foregoing it is evident that observations on hydatidiform mole are extremely variable. Each case must be handled according to its own merits. The best opinion seems to weigh in the direction of emptying the uterus from below in the majority of instances where the cervix is or can be dilated, or at least can be cut. On the other hand certain cases, especially those with long conical cervices in which dilatation or vaginal hysterotomy seem questionable procedures, may be better handled through the abdomen.

CORRESPONDENCE

LONDON LETTER

(From Our Own Correspondent)

London, April 8, 1924.

Sir Kingsley Wood, M. P., in the course of his presidential address at the Faculty of Insurance Conference, held in London on April 5 last, said that we could no longer continue to describe ourselves as a C3 nation. While it was unfortunately true also that we would not boast of attaining the A1 standard, we were certainly no longer a nation of dements or cripples. The falling birth rate had seldom been higher, the infant death rate had seldom been lower. It was gratifying to learn that 80 to 90 per cent of British children were born healthy and with the potentiality of leading normal and healthy lives, but it was an illuminating illustration of the effect of bad housing, poverty, and absence of hygienic supervision that 35 to 40 per cent of the children admitted to school at five years of age bore physical defects which could either have been prevented or cured. There were approximately 35,000 cripple children of school age in England and Wales, representing from one-half to one per cent of the entire school population. Of these in no fewer than 11,717 cases crippling was due to tuberculosis. It was a noteworthy fact, and one which showed the urgent need for a progressive health policy, that 80 per cent of these unfortunate cripples could be cured or improved sufficiently to enable them to take a share in industry if the disability was dealt with early and efficiently and suitable and adequate educational training given. Medicine, Sir Kingsley Wood went on to say, had made great conquests. Typhus, typhoid and smallpox were disappearing. In 1922, 39,000 infant lives were saved in England which would have been lost if the rate of mortality of a previous decade had been continued. A child born today had an expectation of twelve years more life than his grandfather. Sanitation, as Sir William Osler had said, had taken its place among the great modern revolutions, political, social and intellectual. Cholera, plague, tuberculosis and malaria had become controllable. Prevention had reduced the death rate from enteric fever in England and Wales from 874 per million in 1871 to 12 per million in 1922. Even deaths from phthisis had also been reduced. In 1907 they were 1,125 per million, in 1922 the corresponding figure was 874. Mr. L. A. Hill made a remark about the commercialized medical profession which led to a reply from Dr. Cox, secretary of the British Medical Association, who said he wanted to know when it became a crime for men to look after their own interests. A charge of that kind came in very bad grace from trade unionists. So long as the doctors keep up their end fairly and squarely, and did the straight thing, he did not know that they need be told that they were commercialized because they tried to see that they were paid for what they did. They were just as keen as any member of the Faculty that the service should be made as perfect as humanly possible. Colonel Wedgwood, Chancellor of the Duchy of Lancaster, said that insurance was today an even more live question than it had ever been, and the experiment of placing the administration of the very complicated Acts of Parliament relating to health insurance in the hands of outside bodies, autonomously controlled, had proved a success. In 1922 the Approved Societies paid approximately over £9,000,000 ($45,000,000) in respect of sickness benefit, and over £4,000,000 ($20,000,000) in respect of disablement benefit. In addition, there was the provision of medical benefit, for, roughly, fifteen million insured persons, engaging nearly fourteen thousand doctors, and ten thousand chemists' shops, dispensing about thirty-eight million prescriptions at a cost of over £1,400,000 ($7,000,000). Much of the physical inefficiency involving the expenditure of these large sums was preventable, and under better general conditions should be prevented. Certain investigations into cases covering four hundred thousand insured persons indicated that among the chief causes of incapacity were bronchitis and nasal catarrh, diseases of the digestive system, lumbago and rheumatism, influenza, injuries and accidents, septic conditions and debility. A report just issued by the Ministry of Health on so-called rheumatic diseases stated that "nearly one-sixth of the industrial invalidity of this country is due to diseases classed as 'rheumatic.' Each year these diseases are costing the Approved Societies nearly £2,000,000 ($10,000,000) in sick benefit, and the nation over 3,000,000 weeks of work, from the insured population alone." The report confirmed to a large extent the traditional association of dampness of houses with rheumatism, which would be substantially diminished by demolishing slums, abolishing cellar dwellings, reducing overcrowding, and improving houses by letting in sunlight and air and further pointed to the necessity for educating the public in the importance of dental treatment. In the Medical Press and Circular, March 12 last, was a good leading editorial on the problem of rheumatism based upon this report. The amounts now approximately available per annum for the more important additional benefits, said Colonel Wedgwood, were: For hospital and convalescent homes, £276,000 ($1,350,000); dental treatment, £168,000 ($840,000); nursing, £61,000 ($305,000); medical and surgical appliances, £50,000 ($250,000); and optical treatment and appliances, £35,000 ($175,000). In view of the widespread claims for dental and other treatment and preventive benefits, it may be expected that societies will be desirous of devoting in their new schemes, to come into operation in July, 1925 and 1926, a much larger proportion of their disposable surpluses to these treatment additional benefits than was done three years ago.

A special committee has been appointed by the Birmingham City Council to inquire concerning the prevalence of cancer in that city, the facilities for treatment of the disease, and the steps which the council might usefully take to help cancer sufferers. The annual meeting of the General Council of King Edward's Hospital Fund was held in London on April 1 last. It was stated that the year had been an exceedingly prosperous one for the London hos-

(*To be Continued*)

STRANGULATED HERNIA

Editor of the Boston Medical and Surgical Journal,

Dear Sir:

Mr. B., age 56, was operated on in 1912 by a Boston surgeon of good reputation for "pancreatic disease." There was an incision extending from the ensiform cartilage to below the umbilicus which did not heal properly. Some deep layer stitches sloughed, were removed, and when the skin finally healed there was a slight epigastric hernia which enlarged rapidly after two years. Then the recti muscles separated at one or more places lower down and for several years the man has worn a tight abdominal binder. During the last two years the man has had several slight attacks of strangulated hernia in the lower part of the incision just to the left of the umbilicus. These have been reduced by the patient himself by manual taxis while lying on the left side with legs drawn up. On December 30, 1923, he was seized with another strangulation, accompanied by excessive pain and persistent vomiting. The usual measures failed to reduce the hernia and the senior physician was called, who turned the case over to me for reduction. There was a lump as big as my fist to the left slightly below the umbilicus, bluish in color, and so painful that taxis without an anaesthetic was impossible.

My method of reduction was as follows: I sent to the school kitchen for two large-mouthed crockery

bean pots. Into each I put a couple of teaspoonfuls of alcohol which I lit, and allowed to burn until both pots were hot. Just as the flame was dying down I applied one on each side of the lump, the skin having been previously greased, and the pot mouth edges having been cooled with snow. These pots were pressed against the abdomen by assistants while I applied towels wrung out of ice water to each pot. The cooling of the contained air caused a violent suction on the abdominal walls and the tumor was immediately reduced in size. Then I removed the left pot and allowed the patient to lie on his left side in which position the hernia was usually self-reducible. Steady traction was made on right pot and the hernia at once returned to the abdominal cavity with the customary gurgle. I recommended the cold bean pot method of hernial reduction as worthy of trial in all cases of strangulation before resorting to open operation. It did the work in this particular instance cito, tute, et jucunde—not to mention cheaply.

Yours truly,
EDWARD G. ROWLAND, M. D.,
Staff Physician.

A CASE REPORT

Mr. Editor:

The Cabot Case Record, number 10142, in the *Journal* for April 3 of this year brought out a discussion of the etiology of hemmorrhagic fluids in the chest. I would like to briefly record a case which I think justifies the placing of syphilis in the differential diagnosis of this condition.

Mrs. C., 42, white, married, but not living with husband. Father and father's father both died of Cancer. One brother dead, ? "tumors." Mother and five siblings living and well. One son living, 21 years old, and well. No miscarriages. Past history negative, especially for questions regarding skin eruptions. For past five years had had cough and hoarseness in damp weather, but had always been able to work until one week before the time when she was first seen, May 18, 1923. She then complained of pain and distress in the left chest, and a slight, unproductive cough. She was a well developed and fairly nourished woman. Except for very evident signs of a large left pleural effusion, the physical examination was negative. A chest tap yielded a quart and a half of homogeneously bloody fluid. She was sent to the Waltham Hospital, and in the next three weeks four and a half quarts of fluid were removed from the chest. Her Wassermann reaction was positive. The diagnosis was primary Sarcoma of the mediastinum, with Tubercular Pleurisy and intrathoracic Syphilis as second and third choices respectively. The chest fluid was placed in a guinea pig, and was centrifuged and stained for evidences of tumor cells by Dr. Mallory. No tumor cells were found. Six sputum examinations were negative for tuberculosis bacilli. The urine was negative and there was good kidney function. The Xray, in addition to giving the usual picture of fluid, showed a displacement of the superior mediastinum and slight compression of the trachea at the level of the top of the sternum. The temperature ran from normal to 103.5. Iodides and mercury were given, but there was loss of weight and strength until the first of July. At that time Dr. Mallory reported the guinea pig test to be negative. Sarcoma was still the diagnosis, although the fluid was no longer reaccumulating with its previous rapidity and had become less hemorrhagic in character. Dr. Mallory's report placed Tuberculosis in third place and moved Syphilis up to second choice. It was then decided to start intensive antisyphilitic treatment, which to the delight of everyone resulted in rapid improvement. She was discharged from the Hospital, much improved, on August 18, 1923. Under treatment she has since remained well, and now has nothing to show for her "Sarcoma" except slight dullness in the left back.

Although we have not made a thorough search of the literature for accounts of similar activities of the spirochetae, all the physicians who were interested in the diagnostic problems of this case agreed that it was unique in their experience. If it is not uncommon it should be included in any differential diagnosis of a case of hemorrhagic pleural effusion, and if it is uncommon it should be recorded as an anomaly.

DWIGHT O'HARA.

751 Main St., Waltham, Mass.

NEW ENGLAND PEDIATRIC SOCIETY

The eighty-sixth meeting of the New England Pediatric Society will be held at the Boston Medical Library on Friday, May 9, 1924, at 8.15 P. M.

The following papers will be read:

1. Studies on the Etiology of Scarlet Fever, A. R. Dochez, M. D., New York.
2. Observations on The Serum Treatment of Scarlet Fever, Francis G. Blake, M. D., New Haven.

Light refreshments will be served after the meeting. Physicians, students and nurses are invited.

EDWIN H. PLACE, M. D., *President.*
JOSEPH GARLAND, M. D., *Secretary.*

DISEASES REPORTED TO DEPARTMENT OF PUBLIC HEALTH.

WEEK ENDING APRIL 19, 1924.

Disease.	*No. of Cases.*	*Disease.*	*No. of Cases.*
Anterior poliomyelitis	5	Pneumonia, lobar	97
Chicken-pox	169	Scarlet fever	332
Diphtheria	159	Septic sore throat	1
Dog-bite requiring anti-rabic treatment	4	Syphilis	38
Epidemic cerebrospinal meningitis	2	Suppurative conjunctivitis	11
German measles	87	Trachoma	4
Gonorrhea	74	Tuberculosis, pulmonary	106
Influenza	14	Tuberculosis, other forms	30
Measles	812	Typhoid fever	6
Mumps	358	Whooping cough	80
Ophthalmia neonatorum	15		

SOCIETY MEETINGS

DISTRICT SOCIETIES

Bristol South District Medical Society:
The annual meeting will be held in New Bedford, May 1, 1924.

Essex North:—Annual meeting at Lawrence General Hospital, May 7, 1924.

Essex South District Medical Society:
May 7, 1924:—Annual meeting, Relay House, Nahant, in conjunction with Lynn Medical Fraternity.

Franklin District:—Society meets at Greenfield the second Tuesday of March, May, July, September. Annual meeting in May.

Hampshire District Medical Society:
Meetings held bi-monthly, the second Wednesday in the month, at Boyden's Restaurant, Northampton.

Norfolk South District:—Meetings first Thursday of each month at 11.30 a. m. at United States Hotel, Boston. The May meeting is a stated meeting.

Suffolk District Medical Society:

Worcester District:—May 14, Annual meeting.

STATE, INTERSTATE AND NATIONAL SOCIETIES

May 1-2-3:—American Climatological and Clinical Association will meet at The Ambassador, Atlantic City, for its annual convention.

June 3 and 4:—American Urological Association at Ambassador Hotel, Atlantic City, N. J.

June 6 and 7:—Mass. Medical Society, Annual Meeting, New Ocean House, Swampscott.